The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXI. No. 525 JULY 20, 1929 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Telegrams: "Allangas, Fleet, London." Telephone: City 0244

After the Meeting

THE Manchester annual meeting of the Society of Chemical Industry was very much the same as previous meetings held in great industrial centres. There was a succession of entertainments and meals, a few serious contributions in the shape of papers, and a business meeting that had as little to say about the business of the Society as possible. If one asked what particular note of inspiration or initiative the Manchester meeting struck it would be very difficult to answer. It is true that at one of the convivial gatherings Sir Arnold Wilson, faithfully following his brief, talked in more than usually spacious terms of the new cathedral of science that is presently to come into being in London, but we had heard it all before. The only new point is that the Piccadilly Circus site appears to have been abandoned in favour of Westminster or the Adelphi, and the only thing remaining to be done is the raising of that trifling sum of £350,000. The real value of the meeting, once more, is to be found in the personal contacts established. So much is this realised that the suggestion has been made that a less crowded programme, which allowed more leisure for private intercourse, would be welcomed It is a real benefit, especially to the laboratory men, to escape from their groove once a year, and by a brief association with workers in similar fields break up that lonesomeness of which Dr. Redman spoke.

More than one delegate noted with interest the increasing part that the chemical engineers are taking in the Society's affairs and the larger recognition that their branch of science is securing. The contribution of Sir Richard Threlfall, the Society's medallist for this year, was essentially concerned with an adventure in chemical engineering. It was, not merely in the information it disclosed, but in the methods of work it described, a first-class piece of chemical engineering work, worthy to rank with Colonel Pollitt's address on Billingham at Edinburgh and Mr. F. H. Carr's description of his insulin installation at Liverpool. Dr. Little's paper on "Process Development" was somewhat of the same order. At the ceremony of conferring honorary D.Sc. degrees on Mr. Carr and Dr. Little, the emphasis placed on their chemical engineering work could scarcely escape notice. Not that either is less a chemist because he has been successful in commercial production. Both, in fact, have exhibited a very complete command of chemical theory and a real sympathy with the liberal arts. Mr. Carr's scholarly papers in the field of therapeutics have steadily advanced his reputation as one of our soundest authorities This was very happily recognised, not merely in the Manchester doctorate of science he received, but in the invitation to open at the University the new Benger laboratories for pharmacology and pharmaceutical chemistry. Similarly, outside his considerable commercial successes, Dr. Little is known as a first-rate chemist, and as one of the best types of the Boston literary school. The difference between them and so many chemists is that, instead of confining their theoretical knowledge to the library and the laboratory, they have turned it to practical account in industry. This is just where the engineering brain comes to the aid of the pure theorist, and when the two sides are combined one gets the ideal combination. What is true of industry applies to the work of the Society itself. The chemical and the engineering types are widely different, and the Society appears to us to be gaining by the increasing infusion of the chemical engineering element. The participation in the public proceedings of chemical engineering representatives adds perceptible life and interest, and presently one may hope to see some vigorous personality of this type occupying the presidential chair.

There are those who profess to take an entirely complacent view of the Society's finances and membership, though these continue to show a slight but steady decline. Whether this policy is wise the future will show. For the moment, some feeling exists as to the defection of so many who joined for the American tour of last year Proposals, we understand, are under

consideration for ensuring in the future that members who join to secure special temporary advantages shall be obliged to continue their membership for a reasonable period.

A Parliamentary Science Group

IT is interesting to hear that the idea of a Parliamentary Science Group, which has been energetically advocated by Mr. W. P. Dreaper and others for some time past, has at last been realised. A science group in the present House of Commons has been formed of some seventy members—the majority Conservatives, a good minority of Labour members, and a few Liberals. The British Science Guild, we understand, has been largely instrumental in bringing this about, and one may assume that Major A. G. Church, M.P., has not been entirely out of the movement. Whether the members are all men of science in the strict sense need not worry anybody for the moment. The group contains a nucleus who undoubtedly come within this definition, and the other members, interested in science in a general way without fully understanding the subject, will no doubt appreciate the opportunity of acquiring more exact knowledge of many of the scientific questions that come before Parliament. The organisation is still in the early stage, but already there is talk of some corresponding body on an Empire scale.

Overseas Chemical Trade

ALTHOUGH there is a temporary set-back for June in the export of chemicals, as shown in the Board of Trade Returns, the record for the first five months of this year marks an encouraging advance on the figures for the corresponding period of last year. No particular reason can be assigned for the decline, but a few rather erratic changes may be noted in the figures, some of them so marked, indeed, as to indicate certain special circumstances. Of crude glycerine, for example, we imported in June of last year 24,575 cwts.; last month we only imported 900 cwts. Alizarine imports, again, which in June of last year were only 675 cwts., have gone up in the past month to 9,689 cwts. On the export side, sulphate of ammonia is still a fraction better than in June, 1928, but coal tar products have dropped from £134,280 to £126,893. There are reductions also in potassium and sodium compounds, in drugs, in dyestuffs, and even in painters' colours and materials. The progress over the greater part of the first half of 1929 has been so consistent that one cannot but regard the June figures as one of those incidental checks that occur from time to time without any obvious cause, and we shall confidently look for a continuance of the upward curve in the latter half of the year.

Advertising Pays

ADVERTISING plays such an important part in modern business that any new development deserves more than passing notice. A fresh idea has occurred to Harrods, and it is embodied in a full page advertisement which appeared in *The Times* of July 16. The newspaper reader has become accustomed to periodical announcements of guaranteed net sale figures. Harrods have taken a leaf out of the popular newspaper's book and have built up an advertisement on the basis of the total sales effected during their January and July six days' sales for the last five years. The figures in themselves are astonishing; the July, 1929, sale realised no less than £468,226. Even more striking, however, is the progressive increase year by year. The advertisement suggests two reflections—(1) That there is no reason for pessimism about the state of the retail trade of the country; (2) that the announcement is in effect an acknowledgment of the enormous selling power of advertising. If enterprise is the first requisite of success in modern business, successful advertising is the foundation of modern enterprise.

Lime as a Flotation Reagent

REVERTING to some United States figures relating to reagents for flotation purposes, published on July 6, it may be noted that in the treatment of copper ores, lime constitutes over 90 per cent. of the total reagent consumption. In the flotation of zinc ores, the most striking feature is the large and general use of copper sulphate, and the large but localised use of sodium silicate. The large consumption of copper sulphate in the flotation of straight zinc ores is natural, when it is considered that sphalerite is almost universally floated as a copper-sulphide-surfaced mineral. When compared with straight lead ores, it is apparent that proportionally more chemical collectors and less of the oils are used in the flotation of zinc ores.

The most interesting, perhaps, of all the ores covered by the survey are the complex lead-zinc ores. These generally contain substantial amounts of pyrite and pyrrhotite, which is discarded, although in some instances it is collected as a third concentrate. The most striking features brought out are the large consumption of alkaline reagents as compared with the consumption of the same reagents in the flotation of lead ores and of zinc ores; the large consumption of cyanides, zinc sulphate, sodium sulphite, and the comparatively large amount of collectors, both oils and chemicals, that apparently are needed. Larger consumption of alkaline reagents may perhaps be ascribed to the fact that the lead-zinc and lead-zinc-iron ores contain more sulphide minerals than straight lead or straight zinc ores, and that therefore there is more material to oxidise, and a larger quantity of acid salts requiring neutralisation is formed. The larger per-ton consumption of copper sulphate is no doubt due to the fact that deadened sphalerite is more difficult to float than sphalerite that has been neither deadened nor activated, and therefore calls for larger amounts of activating reagents.

Books Received

THE ECONOMIC SITUATION IN ITALY, April, 1929. By E. C. Donaldson Rawlins and H. C. A. Carpenter. London: H.M. Stationery Office. Pp. 105. 3s.

DAS BUCH DER GROSSEN CHEMIKER. Vol. I. Zosimos zu Schönbein. By Dr. Günther Bugge. Berlin: Verlag Chemie. Pp. 496. M.24.

THE SOUL OF MANCHESTER. Edited by W. H. Brindley. Manchester: Manchester University Press. Pp. 280. 6s.

LEWIS'S MEDICAL AND SCIENTIFIC LIBRARY CATALOGUE. London: H. K. Lewis and Co. Pp. 576. 15s. (subscribers 7s. 6d.).

AN INTRODUCTION TO THE CHEMISTRY OF PLANT PRODUCTS. Vol. II. Metabolic Processes. By P. Haas and T. G. Hill. London: Longmans Green and Co. Pp. 218. 10s. 6d.

THE SOAP MAKERS' DIRECTORY, 1929. London: Simpkin Marshall, Ltd. Pp. 86. 2s. 6d.

The Society of Chemical Industry

Concluding Notes on the Manchester Meeting

The following notes and reports of the annual meeting of the Society of Chemical Industry in Manchester are in continuation of those published last week which covered the opening stages of the proceedings.

So crowded was the six days' programme with luncheons and dinners, garden parties, receptions and dances, technical sessions, industrial visits and holiday excursions, that only a few of the more interesting (or those one was able to get to) can be selected for comment. Tribute may at once be paid to the excellent arrangements made by the Manchester Section, with Mr. Cronshaw as chairman and Mr. McCulloch as secretary. Their services were so much taken for granted that the proceedings nearly ended without any formal acknowledgment—which, in some ways, might have been taken as the greatest compliment possible. While the social events were well attended, the attendance at the business and technical sessions was not impressive, and discussion, which often proves the most interesting feature of such meetings, was almost entirely absent. The annual meeting was a very perfunctory affair, though the agenda included matters of great interest to the Society, and it is a question whether the occasion might not be used for awakening a little more enthusiasm among the members in the work of their own body.

Among the technical sessions, that at which Sir Richard Threlfall received the Medal of the Society and gave his address on "The large scale electrolysis of fused zinc chloride" was one of the best. The presentation was made in graceful terms by Dr. Little, and was acknowledged very simply by Sir Richard, who remarked that the occasion marked the culminating day in his life's experience of scientific work. "My chief interest," he said, "has always been scientific research work, and I have now worked in the laboratory daily for fifty years." Occasion was taken to recall something of Sir Richard's scientific career. Formerly Professor of Physics at Sydney University, Australia, he has, since becoming associated in 1889 with Albright and Wilson, Ltd., phosphorus manufacturers of Birmingham, directed his attention mainly to the application of engineering, especially electrical engineering, to chemical manufacture. He achieved distinction for his work in connection with naval and military smoke screens, the use of helium in airships, and instruments for detecting the presence of explosive mixtures. It may be news to many that the success of the historic naval attack on the Mole at Zeebrugge was largely due to the smoke screens organised by him.

Sir Richard had committed his experiments in detail to paper, but he did not follow his MS. On the contrary he broke off again and again to enter into verbal descriptions of his experiences, and in that way dropped quite a number of practical engineering hints, which were very quickly noted and appreciated by his hearers. He treated the whole subject with the easy familiarity of a master, and with the engineer's mind for telling just the essential points and leaving irrelevancies severely alone. Much of the work described was begun before the war and it was only some years later that the threads were gathered up and the work completed. It may be interesting to recall that Sir Richard has not been the only worker in this field. Others have been making experiment and investigation in the electrolysis of fused zinc chloride, and by these the full disclosure of his "adventure in engineering" was followed with particular interest and appreciation. I believe it is true to say that Sir Richard overcame certain "snags" that baffled the other workers, and the records and detailed explanations of how he secured his results have an interest of quite a special kind from this point of view. What struck one about his lecture was not merely its practical informative character, but his obvious wish to tell everybody all he knew of the subject, without any reservations.

Many people professed to be keenly interested in Professor Pear's address on "The human factor in industry," which proved to be one of those introspective psychological studies that always catch one. Personally, the whole treatment of the subject seemed to me to be rather overdone; it was worked out with the assurance and meticulous detail with which some Caroline divine might expound the doctrine of justification by faith or final perseverance. This, perhaps, is inevitable, being more or less inherent in the study of mentality, motor impulses, reactions and all the rest. Even the simplest common-sense rules ought, one supposes, to rest on a bedrock of theory, but in works administration an over-elaboration of theory may result in mere fussiness. All the same, as I have said, many found Professor Pear extremely interesting and suggestive, and were looking forward to a more leisurely study of his lecture. There was nothing speculative or theoretical about Dr. Little's address on "Process Development," which had already been submitted to an American audience. He traced the stages through which a process has to pass from its conception in the mind of the inventor to its translation into commercial practice with great clearness, and as a short history of such developments, his paper could hardly have been improved on. It was the second of Dr. Little's contributions that will certainly be remembered.

There was a very large attendance at the luncheon given by the Clayton Aniline Co., and the speaking indicated the pleasant personal relations that exist between competitors in the dyestuffs industry. The address of Dr. A. Schedler, chairman of the company, who presided, is published in this issue. He described the Clayton Aniline as "a Swiss-owned British firm of colour makers engaged in friendly competition and collaboration with English firms in the supply of dyestuffs to consumers in this country." The company is owned by the Society of Chemical Industry in Basle, the Sandoz chemical works and J. R. Geigy, and it was with obvious pleasure that Dr. Schedler introduced the original founder, Dr. Dreyfus, a guest at the high table, and "a radiant picture of health," in spite of his 82 years. There was one observation by Dr. Schedler that met with an obvious response. It was a reference to the processes of amalgamation now going on and his prophecy that though the small producer may have to struggle hard he need not despair. "There is still room," he confidently declared, "for the small producer, but he will have to confine himself to a small area; in other words, he will have to specialise." That is a conclusion obviously to which others have come—that the small producer, confining himself to a limited range of colours, producing efficiently and economically under direct personal management and giving personal attention to the needs of his client, may still find a means of surviving.

The garden party at Ford Bank, Didsbury, given by Dr. and Mrs. Levinstein was a great success; the rain fortunately kept off, and the park-like grounds that surround the residence looked extremely well. The guests

A Panoramic Photograph of the Guests at

were received by Dr. and Mrs. Levinstein, and afterwards there was tea and dancing in a marquee, and the Pipers of the 1st Batt. Scots Guards played selections and gave several exhibitions of Scottish dances.

The day excursion by train to Warrington to inspect the works of J. Crosfield and Sons, attracted a very large number of visitors, who were first entertained to lunch, then taken over the works in parties, and finally presented with samples of the firm's products. A remark by the Chairman during luncheon is worth recalling. Mentioning face powder as one of the Crosfield products, he observed: "You may catch a man with face powder, but it takes baking powder to keep him."

There was a distinguished company present at the reception by the University of Manchester at which the honorary degree of Doctor of Science was conferred on Mr. F. H. Carr and Dr. A. D. Little. The excursions of one kind and another were very numerous. They included visits to the Ship Canal docks; the Shirley Institute, Didsbury; the Royal Exchange; the works of the British Oxygen Co. and C. Mackintosh and Co.; the works of J. Crosfield and Sons, Warrington; the Safety in Mines Research Station at Harpur Hill, Buxton (where a number of papers on fuel problems were read); the works of the Chloride Electrical Storage Co., Clifton Junction, Trafford Park Estates, Ltd., Metropolitan Vickers Electrical Co., Trafford Park, Brookes Bread Co., and Pilkington's Tile and Pottery Co.; a whole day excursion through the Derbyshire Peak District; a dinner given by the British Dyestuffs Corporation; and a garden party at Alderley Park, Cheshire.

It was with regret one heard that one of the contributors to "The Soul of Manchester," Mr. Gordon Phillips, is suffering from a serious breakdown of health.

The Human Factor in Industry

The meeting was resumed in the Examination Hall of the Municipal College of Technology, Manchester, on Wednesday morning, Dr. H. Levinstein taking the chair.

Best Conditions of Work

Professor T. H. Pear read a paper on "The Human Factor in Industry." He said that the aim of industrial psychology was to discover the best possible human conditions in work. These might relate to the best choice of a vocation; selection of the most suitable workers; the most effective means of avoiding fatigue, distraction of interest and boredom; the provision of the most effective (and socially desirable) incentives to work; the causes of, and remedies for irritation, discontent and unrest; the best methods of work; the best methods of training for that work (and even finding the best people to teach the best methods by the best methods); the reduction of needless effort and strain due to bad movements and postures, inadequate illumination, ventilation and temperature, or the ill-considered arrangement of material, or defective lay-out or organisation; the provision for utilising the skill and knowledge of workers who might be displaced by mechanical inventions; the healthy and suitable employment of leisure, together with the provision of interest which would make that leisure profitable.

The early ideas of improving methods of work had their limitations. As an example, he referred to the early ideas underlying motion study. Its aims were, and still are, to eliminate useless movements, to shorten and improve necessary movements, and to teach those movements. The assumption that the shortest path of movement for any part of the living body was necessarily the most economical conflicted with physiological and psychological facts. The idea that by finding the best units of movement for different employees one could add them in serial order to make the best possible complicated movement conflicted with the fact that in human movement the whole was never the sum of its parts. Motion study in England laid stress on the desirability of a movement easy as well as short, and upon the preservation of an individual pattern of movement if that pattern were not undesirable. Finding the man for the job was important and useful; finding the job for the man marked a stage in human progress.

Rest Pauses

Discussing the problem of providing rest pauses for industrial workers, he pointed out that the duration and frequency of such rest pauses must differ with different types of work. For instance, rest pauses might be introduced just at the stage when a man was beginning to get into the swing of his job and before he was beginning to feel fatigued, and the introduction of rest pauses at such times was unwise. A study of the work curve showed quite clearly that there was a rise in the curve just as a man became warmed up to his job, and that after a certain period there was a fall, and it had become clear that rest pauses were best introduced just when a man was approaching his maximum output.

Describing the aims of vocational guidance, to which vocational selection was only a half-way house, he pointed to the desirability of making a census of those occupations in which the human factor, as compared with the machine factor, was really important. The very serious social problem which was created by the exclusion of skill from many tasks suggested in turn the necessity of alleviations for the mechanisation of

DR. AND MRS. LEVINSTEIN'S GARDEN PARTY *London Panoramic Co.*

industry. For this reason, education not only for work but for leisure would become one of our greatest necessities.

A Dyehouse Experience

Mr. C. M. WHITTAKER (of Courtaulds) said that he had installed recently, in a dyehouse, a tunnel drier having endless chains, and girls were employed at one end dropping bolts into slots which had skeins of silk on them. He had remarked to the forewoman that this appeared to be the most monotonous job in the dyehouse, and had suggested that the girls so employed should change their tasks frequently, and should not be employed on that particular job for lengthy periods. He was surprised, however, when the forewoman had told him, three days later, that three of the girls had asked to be employed permanently on this particular job. He asked Professor Pear how psychologists would classify those three girls.

Professor PEAR replied that this matter had been studied in considerable detail. The first thing to be realised was that the work itself was repetitive, but it need not be monotonous. The work was a series of events which repeated themselves in time, just as in the motion of the stars, and one had no more right to call that work monotonous than one had to call the sunset and sunrise monotonous. It was the reaction of the individual mind and body to the repetitive work which the psychologist began to study, and he was finding extraordinary differences. The most enthusiastic writer on repetition work —Mr. Ford—had admitted that the prospect of it would appal him.

There was a class which liked repetition work, and a class which was appalled by it. There was a type of person who liked repetition work because he was free from responsibility; whether that outlook ought to be encouraged to any large degree was a social question, and not necessarily industrial —and it might be even a political question some day. There was also the kind of person who liked it because he could think of something else while doing it and that might be an advantage socially if they were thinking of something constructive; but often they were not. There was also the type of person whose intelligence was of such a low level that he liked monotonous work. Again, there was the type of girl who did the work because she hoped to get married within a few months, and did not mind what she did in the meantime.

Process Development

In the course of a paper on this subject Dr. ARTHUR D. LITTLE said: The function of applied chemistry is the development and control of processes, for it is through processes that we pass to the products we desire. The factors involved in process development are therefore of primary importance to the chemical engineer who must develop the process, to the financier who must supply the funds for the development, and to the manufacturer who must operate the process in the form which it finally assumes. The interest of the general public, though less direct, is no less real, since the price which it must ultimately pay for the products it wants is largely determined by the efficiency of the processes by which they are produced.

Though we look to the chemist for the conception and initial demonstration of chemical processes, their commercial development is the proper business of the chemical engineer, and because there are many pitfalls on the long and rocky road which leads from the laboratory to the plant, it is fortunate for our industries that chemical engineering has gained recognition as a distinct and arduous profession. Happily, with this recognition we are beginning to make adequate provision for the education and training of the chemical engineer himself. Whereas from the point of view of the old industrial chemistry a chemical process was regarded as an indivisible entity to be considered and dealt with as a whole, the chemical engineer is taught to look upon the process as a co-ordinated series of unit operations most of which are distinctly physical, rather than chemical, in character. He therefore brings to any specific development a familiarity with the many types of equipment available for such unit operations as grinding, mixing, heating, separation, and so on. He has supplemented a sound training in chemistry by an intensive study of the laws of heat flow, the properties of fluid films, and the characteristics and limitations of materials of construction. He has learned that there are only one hundred cents in a dollar, and that the success of any process depends on their proper allotment.

Unfortunately, the mortality rate of infant processes is high, and their early demise is most commonly attributable to causes which antedate the ministration of the chemical engineer, or which, developing later, are quite beyond his control.

A study of the thermodynamics of the process as conceived may prove its initial basis to be unsound. It may perish for lack of novelty, which a study of the state of the art discloses, or, if this fundamentally essential study has been lacking in thoroughness or, as sometimes happens, been neglected altogether, the disclosure may be delayed until rejection by the Patent Office after much expenditure of time and money.

Many processes which survive the rigours of the Patent Office never attain commercial development, but die a lingering death for lack of outstanding merit. This is conspicuously exemplified by the multitude of patents covering processes for the cracking of petroleum. Thousands of such patents clog our files and hamper real developments, while the processes themselves remain in the incubator gasping for breath.

Processes Born Too Soon

Not infrequently good processes die young simply because they are born too soon. They come into the world before it is ready to receive them. In 1851, for example, Charles Watt took out a British patent, number 13,755 of that year, which was remarkable for the completeness with which it disclosed the conditions necessary for the electrolysis of sodium and potassium chlorides for the production of chlorine and alkali, hypochlorites and chlorates. It made no impression on the art simply because the world then had no cheaper source of current than the expensive primary battery.

Initial engineering difficulties often delay for years the development of processes which in themselves are essentially sound. This, as you all recall, was notably the case with the Solvay process for sodium carbonate. In 1838 a process for making soda by passing carbon dioxide into a solution of common salt in ammonia water was patented in England by Dyar and Hemming, but not until 1873 were its more serious engineering difficulties overcome by Ernest Solvay, of Belgium.

In 1880 the American rights were acquired, and soon thereafter a 50-ton unit was built at Syracuse, New York. What happened then is thus recorded by Dr. L. C. Jones :—

"The first year of operations at the new Syracuse plant was, according to all reports, a twelvemonth of pure trouble. Although there were French and Belgian chemists and engineers, and a number of Belgian foremen on hand, the great difficulty was with apparatus. This is not surprising, for the ammonia-soda process was the very first gas-pressure distillation-evaporation problem which our equipment makers had to help solve. Several workmen were killed, and there were many accidents, much wasted materials, and disappointment after disappointment. In the end, however, the triumph was so complete that the plant was able to double what had been its projected 50 ton capacity. From that time forward the enterprise was increasingly successful. To-day the Syracuse plant is the largest soda ash operation in the world, with a daily capacity of 1,800 tons."

In 1867 Benjamin C. Tilghmann, of Philadelphia, invented the sulphite process for wood pulp. He abandoned its development after expending a considerable sum in the effort to solve the problems involved in the use of lead-lined equipment. Not until the early '80's did the process establish itself in Europe, and not until 1884 did it return to this country, where its position was precarious until Russell, in 1891, brought out the cement-lined digester. Now several thousand tons of sulphite pulp are daily produced in the United States and Canada.

The first sulphite pulp mill on the American continent was that of the Richmond Paper Company at Rumford, Rhode Island, and my first job was that of chemist, and later superintendent, of that plant. I lost eight pounds in the first two weeks, and as I weighed only 140 lb., it looked as though I would last just 35 weeks. The process was all right, but the engineering was all wrong. For cooling the sulphur dioxide they had installed 60 ft. coils of 6 in. lead pipe in tubs of water. When the sulphur burner allowed his furnaces to get too hot the coils plugged with sublimed sulphur. Slits had then to be cut and opened up at short intervals in the pipe to permit cleaning, and the lead was then hammered back and the slit closed by burning. After some weeks of that we substituted a rational sort of cooler with straight pipes with crosses at the ends for easy access.

These examples, like many others which might be cited, demonstrate that major process developments are things which timorous investors should let alone. The great rewards go only to those backers who have vision, confidence, and a grim persistence.

Lack of vision on the part of those responsible for its financing caused the abandonment forty years or more ago of the brilliant demonstration by Bradley and Lovejoy of the fixation of atmospheric nitrogen in an apparatus in which 400,000 arcs were made and broken each minute. Their yields equalled those obtained many years later in Europe by the rotating arc; but when the original appropriation of $124,000 was exhausted their myopic backers could see nothing beyond the balance sheet.

Where process development is concerned the knock of opportunity is often mistaken by the hard-headed business man for that of the bill collector. A chance remark by Dr. George F. Kunz on the industrial value of abrasives turned the thoughts of Acheson to the problem of their artificial production, and led to the discovery, in 1891, of carborundum and its subsequent manufacture on a small scale at Monongahela City, Pennsylvania.

It was the same dogged persistence based on an abiding faith which led Count de Chardonnet to the successful development of artificial silk after three companies organised by him had failed. The world is now producing some 200,000,000 lb. a year.

Proceed by Steps

As to the procedure in process development, all authorities are agreed that the only safe method is by steps, each on a progressively larger scale. As Dr. Baekeland puts it, "Make your blunders on the small scale, and make your profits on the large scale."

The first step to follow the conception of the process is naturally that of testing the validity of the proposed reactions. This can usually be done on the small laboratory scale in extemporised equipment, which most commonly is of glass. If the desired product is obtained, and the proposal otherwise appears sound, there should immediately follow a thorough literature and patent search to ascertain the state of the art.

The essential novelty of the process having thus been determined, one may proceed to operation on the large laboratory scale. Fortunately pyrex glass lends itself readily to the construction of much equipment for this purpose, and is procurable in the necessary sizes. Yields may now be determined with rough approximation, some initial difficulties disclosed and overcome, and the conditions recognised which are essential to success. Probably numerous side lines of requisite research will be suggested.

Unless the project is sponsored by a corporation as a development for its own use and purposes, the costs thus far must in almost every case be borne by the laboratory or individual responsible for the process. If, however, all has gone well thus far, and if a provisional balance sheet holds promise of satisfactory ultimate profit, funds for the next immediate stages of development may properly be solicited from a group of individuals singly or as a syndicate, taking care, in the selection, to observe Dr. Baekeland's warning that the personal and business qualifications of subscribers are of far greater importance than the money they provide.

Since each successive stage of development will now require new increments of capital, control of the situation will almost necessarily soon pass out of the hands of the creators of the process. The adequate protection of their interests requires, therefore, in the agreements of financing, exact definition of the extent of their participation in any form of compensation ultimately received for the process or of their equity in any company formed for its promotion. Otherwise a satisfactory percentage interest in the original syndicate is likely to be whittled down close to the vanishing point in subsequent negotiations for more capital.

With funds for the development in hand or underwritten, the next stage is the construction of a small experimental plant, in the design of which are embodied the conclusions from the experience and data thus far obtained. Provision should be made for the utmost flexibility in the operation of the plant in order that temperatures, pressures, and other factors involved may be varied over a wide range in the search for optimum conditions.

In this plant new difficulties will develop and be ironed out, materials of construction tested, the relative capacity of parts determined, a preliminary heat balance drawn, and some idea of costs obtained. Yields should be improved, and the quality and fitness of the product tested for itsi ntended uses.

Before proceeding further a cold-blooded survey should be made of the project as it now stands and the chances of its success estimated without prejudice. We will assume that the results of your survey encourage you to go ahead and justify your backers in further expenditure. You will then construct a plant of semi-works size designed to conform as far as possible to the conditions required for commercial operation. It is very desirable to utilise standard equipment in such a plant wherever this can be done. Fortunately many equipment manufacturers supply units of the necessary small size.

You are now in position to put your process to its real test. The skill or lack of skill with which equipment has been balanced will now be evident, as will the adequacy of your methods of control. Yields will be further improved and product obtained in quantities permitting its preliminary trying out in friendly hands. Any defects in materials of construction or limitations of units of equipment will be revealed and suggest desirable modifications of design.

Not until this semi-works plant has been in satisfactory operation for several months can you feel assured that you have the necessary background of experience and data to permit your going to the final step of pilot-plant design. This will consist of a single unit of full commercial size so planned

as to permit expansion by the addition of other corresponding units. During its construction many supplementary but highly important matters must be studied and decided—your sales policy and advertising: your containers, packages, and labels; the shipping regulations of the Interstate Commerce Commission or its Canadian equivalent; insurance requirements and provisions for minimising accidents.

Not until the operation of this plant has verified your estimates of cost and your product has been sold at a satisfactory price—and, as Dr. Whitaker says, "stays sold"—can you feel that you have reached the goal of the long road of process development. If your original group of investors are still with you, you are to be doubly congratulated. Dr. Bergius, speaking from broad experience, said recently, in New York, that the most difficult problem in major process development was that of keeping the same financiers throughout. As a rule, he had found that they would last only five years.

The Society's Medallist

Presentation to Sir Richard Threlfall

At the meeting of the Society on Thursday morning, July 11, the Society's medal was presented by the President (Dr. Little) to Sir Richard Threlfall, F.R.S.

The PRESIDENT, making the presentation, said that it was unusual for a man who had attained high honours in the field of pure research to leave academic life and to act as a pioneer in the more difficult domain of industrial investigation; yet Sir Richard Threlfall was such a man. A product of Cambridge, where he was a "Rugger" Blue, he had early in life transferred his activities to Australia, where he had made his name as an experimental physicist. Later, seeing the need for industrial progress on scientific lines, he had joined the firm of Albright and Wilson, of Oldbury, Birmingham, for whose scientific development he had ever since been responsible. There he had been instrumental in introducing methods for the manufacture of a large number of inorganic products mainly related to the production of phosphorus and its derivatives, and also of a considerable variety of organic substances of a high degree of purity.

During the war he had rendered signal service to the country in devising various appliances for the Ministry of Munitions, especially those connected with the use of phosphorus as a smoke-producing agent. He had served on many important committees, and when the Department of Scientific and Industrial Research was started in 1916 he was one of the first to be appointed a member of the Advisory Council. In that capacity he had acted as Chairman of the Fuel Research Board, and was mainly responsible for the installation of the Fuel Research Station at Greenwich. He was also Chairman of the Chemistry Research Board, and in that capacity was responsible for the initiation and establishment of the Departments' Chemical Laboratory at Teddington. For his services during the war he was created a Knight Commander of the Order of the British Empire, and for his subsequent services was created a Knight Grand Cross of the Order.

The award of the Gold Medal of the Society of Chemical Industry was a fitting recognition of his achievements, for he had been able to combine a wide knowledge of chemistry, physics and engineering and to utilise them in the service of industry. In fact he was, in the best and truest sense, a chemical engineer.

Sir Richard Threlfall, in acknowledging the presentation of the medal, said he found it difficult adequately to express his thanks. Perhaps he could give some idea of his feelings, however, by referring to his life of experimental work. His first recollection was of asking his father to show him how to make what was then called a galvanic battery. At that time he was certainly not more than eight years old. He was told that he was not old enough, but since that time he had concluded that there was perhaps some other explanation; at all events, he had not learned how to make a galvanic battery until a good many years afterwards.

Since then his chief interest in life had been in scientific work, and he had catholic tastes in that direction. At one time he had worked on biological matters; he had also worked at chemistry, had been a Professor of Physics, and from that he had drifted into engineering of two varieties. But always his chief interests had been in connection with scientific matters. He had worked in a laboratory every day for fifty years. In consequence, when he received recognition such as the award of the Society's Medal—which was the highest honour that could be given to a technical man in the whole of the English-speaking races of the world—his feelings could better be imagined than described. He regarded this as truly the culminating event of a life spent in experimental work, and he again expressed his thanks for the honour done him.

Sir Richard Threlfall then delivered an address on "The Large-Scale Electrolysis of Fused Zinc Chloride—an Adventure in Engineering."

The President, in expressing thanks to Sir Richard for his address, said he had given an extraordinarily interesting and illuminating demonstration of the application of chemical science and engineering to a most difficult problem, and after having enjoyed listening to it he could well understand why Sir Richard was so worthy a Medallist of the Society.

Clayton Aniline Co.'s Luncheon

The members and visitors on Wednesday were entertained to luncheon at the Midland Hotel by the directors of the Clayton Aniline Co., Dr. A. Schedler presiding.

Mr. C. J. T. Cronshaw (chairman of the Manchester Section) proposed the toast of the Clayton Aniline Co. The history of the development of organic chemical manufacture in this country, he said, could not be written without reference to the names of the Clayton Aniline Co., and to the well-known firms in Switzerland—the Sandoz Co., the Geigy Co., and the Society of Chemical Industry in Basle. He proposed the toast, and coupled with it the name of Dr. Schedler, to whom he referred as a leader in scientific work, a member of the Committee of the Manchester Section of the Society, the Swiss Consul in Manchester, and also the chairman of the Consular Association of Manchester.

Dr. E. Ardern supported the toast and the expression of thanks to the company and Dr. Schedler for the hospitality extended to the members of the Society and the visitors.

Dr. Schedler, on behalf of the directors of the Clayton Aniline Co., expressed his heartiest thanks to the mover and seconder. He was particularly touched, he said, by the remarkable manner in which Mr. Cronshaw had divested himself of all restriction naturally adhering to him as a competitor, and, speaking as chairman of the Manchester Section, had given free vent to his feelings and had expressed himself in such generous terms regarding the company. Mr. Cronshaw had been a remarkable chairman of the Manchester Section in various respects, but on this occasion he had crowned his work by the way in which he had recrystallised his person by means of a minute quantity of alcohol, making a resultant product that was 100 per cent chairman, with no trace of competitive by-products. Having done this, he had fractionated his personal feelings, isolated the most tender fraction, and showered the fragrant stuff upon his competitor (laughter). He (Dr. Schedler) was equally indebted to Dr. Ardern for his kind reference. Dr. Ardern was an old friend to the company; they saw him mostly when they were in trouble. It was very gratifying, therefore, to respond to him on an occasion when he had found no fault with them, and when no doubt he had satisfied himself that all he had partaken of was well within the limit of 5 parts per million of arsenic.

Importance of Anglo-American Friendship

The company appreciated to the fullest extent the great honour of welcoming as their guests members of the Society of Chemical Industry, that great organisation which comprised every chemist of repute in the English-speaking parts of the world. He was particularly glad to welcome colleagues from overseas, especially from the United States, headed by the esteemed president of the Society, Dr. Little, accompanied by Mrs. Little. It had been said that understanding and friendship between America and England were the greatest guarantees of the peace and well-being of all nations, and he added that this understanding and friendship were also very important for the development of our science in general, and the welfare of the Society in particular. He felt sure the visitors would take away with them the conviction that this friendship did exist, and that they would look upon this invitation as an expression of that friendly feeling. The company were equally honoured to have present the new president of the Society (Dr. Levinstein), accompanied by Mrs. Levinstein. By accepting the honourable position of president, Dr. Levin-

stein had given further proof of his desire to serve the common interests of chemistry as a science and as an industry. The company's thanks were due also to those of their guests who represented public institutions or firms connected with chemical science or chemical industry, and who by their presence had paid homage to the Society.

The Clayton Aniline Co.

It might safely be presumed that some of those present, particularly those from other districts or from abroad, would be asking who were the Clayton Aniline Co., who had had the audacity to invite such an illustrious body of representatives to be their guests. Whereas it was usually the duty of the hosts to introduce and acquaint the guests with each other, he was in the peculiar position of having to introduce the hosts to the guests. They were a Swiss-owned British firm of colour manufacturers, engaged in friendly competition and collaboration with English firms in the supply of dyestuffs to consumers in this country. The company was owned by the three leading Swiss chemical works—the Society of Chemical Industry in Basle; the Chemical Works Sandoz; and J. R. Geigy—whose names were familiar all over the world where chemistry, pure or applied, had found a footing.

In 1911 they had acquired an old-established chemical works founded in 1876, and had developed and extended it in accordance with the requirements of the times. It gave him particular pleasure to welcome and introduce to the gathering the original founder, Dr. Dreyfus, who was a guest that day, and whom one could not better describe, in spite of his 82 years, as a picture of radiant health. The principals of the company, by establishing themselves in this country, had exported and surrendered their knowledge and experience, accumulated during many decades for the development of the industry, to the benefit of this country.

Room for the Small Producer

The annual meeting of the Society of Chemical Industry was an appropriate occasion on which to view the situation of chemical industry, backward and forward. It could safely be said that the development of chemistry had been marvellous. No doubt the war had given to chemistry as a science and as an industry a tremendous impetus. The transformation of war plant into peace plant had created a productive machinery, the capacity of which was far greater than present requirements. The consequences were the same as were observed in other branches of industry under the same conditions. There was the tendency towards amalgamation, concentration, rationalisation, and internationalisation in the industry. Concerns had been created, the extent, absorption power and resources of which must be called gigantic.

No doubt the small producer would have to struggle hard to hold his own, but he need not despair. There were still numerous possibilities, and the field of application and development in chemistry was so great that no single concern, however powerful, could itself cover the whole area; there was still room for the small producer, but he would have to confine himself to a small area—in other words, he would have to specialise. We must not look for our inspiration back to the horrors of the battlefield, but to the peaceful pastures of Mother Earth and its requirements. We must not produce the means of destroying life, but the means for its preservation, its prolongation, and for everything that made life worth living.

In conclusion, Dr. Schedler tendered his best wishes for the continued success and prosperity of the Society of Chemical Industry.

On Wednesday afternoon, the members and visitors attended a garden party at Ford Bank, Didbury, at the invitation of Dr. and Mrs. Herbert Levinstein, at which, following the reception, they enjoyed music, dancing and entertainments. The annual dinner of the Society was held in the evening in the banqueting hall of the Midland Hotel, Manchester.

Mellon Institute Bibliographical Bulletin

THE MELLON INSTITUTE OF INDUSTRIAL RESEARCH (University of Pittsburgh) has published the annual supplement to its Bibliographical Bulletin No. 2. This is a list of the books, bulletins, papers and patents published by members of the Institute during 1928, and includes one book, 14 bulletins, 15 research reports, 104 other scientific and technical papers, and 25 United States patents. Copies of this supplement will be sent to any chemists, librarians or teachers who ask for them.

Water Purification Plant

Exhibits at the Sheffield Exhibition

THE Paterson Engineering Co., Ltd., are exhibiting their well-known chloronomes, including the Manometer, Pulser, Automatic and Bath types, at the exhibition of the Royal Sanitary Institute, opened at Sheffield on Saturday.

The automatic chloronome has successfully overcome the difficulties experienced in the past in accurately applying a sterilising reagent to a water supply with a fluctuating rate of flow. This instrument is controlled by a venturi tube inserted in the pipe line and connected to the instrument, so controlling the measurement of gas in proportion to the flow of water.

Among the other exhibits is a fine model of four 8 ft. diameter Paterson pressure filters. One of the units is constructed to enable the interior of the filter to be inspected. The model is a typical example of the filtration plants which the Paterson Engineering Co. have installed for the City of Sheffield Waterworks Department at Damflask, Ewden Valley, and Rivelin. Filtration plants of this type have been installed by this company at Bournemouth, Chelmsford, Bradford, Croydon, Carlow, Port Elizabeth, etc., and at present they have plants under construction for the City of Halifax, Loughborough, Jersey, West Gloucester, Londonderry, etc. The pressure type filter is usually used with bath water purification plants, and plants of this type have been installed at Bradford, York, Cleethorpes, Wolverhampton, Wednesbury, Cardiff, Poole, Greenwich, Beckenham, Guildford, Bristol, etc. Photographs are shown of Paterson gravity type filters installed by the Metropolitan Water Board, London, and other authorities for the filtration of drinking water supplies. Diagrams illustrating the application of the chloronome to various sources of water supply are displayed.

A very interesting testing set is exhibited which is described as a chloroscope for the accurate measurement of free chlorine in water. This piece of apparatus is very compact, light, and has been specially designed for use by unskilled labour. Its accuracy enables a chemist to utilise it for laboratory determinations.

Zinc Manufacturing Co.

Mr. H. E. Coley on Company's Prospects

THE statutory meeting of the Zinc Manufacturing Co., Ltd., was held on Wednesday, at Winchester House, Old Broad Street, London. Mr. H. Edwin Coley (chairman of the company) presided.

The chairman in the course of an explanatory statement said: "On May 1 the company took over from the N.C. Zinc Oxide Co., Ltd., the premises at Dartford, the one unit of plant which was then in operation, all stocks of ores and finished product, and the six partially completed plants which it had been the intention of that company to erect. As a result, this company has been extracting zinc from ore from one plant continually since May 1. You will recollect that the programme laid down in the prospectus was, first of all, the erection of the six new plants in England, and the production of 5,000 tons of spelter in the first twelve months. The second part of the programme was the purchase and erection of sufficient further plants to make a total output of 50,000 tons of spelter possible in the second year. The work on the six new plants is well in hand, and we expect to have the advantage of producing spelter by these plants for at least six months during the first financial year of the company.

"We have made all arrangements with regard to the purchase of ore on satisfactory terms. We have purchased land in Tunis for the erection of plants, and we have ordered all the plants that are necessary to complete the programme. These plants are being manufactured as quickly as possible, and a satisfactory staff has been appointed to carry out the work of construction, and eventual manufacture in Tunis, under the best possible conditions. Your directors have no doubt that it will be possible to carry through this work of construction in the time allowed in the original programme, and they are confident that the results that will be obtained from working the plant when completed will fully warrant the estimates made in the prospectus. Your directors have only one object in view, namely, to make the company a successful manufacturing concern, and they much prefer that the ultimate value shall be judged by the results of their work in the immediate future.

Tendencies in Modern Industries

By the Rt. Hon. Lord Melchett

The article below contains the substance of Lord Melchett's address on Thursday, July 4, to the Industrial Co-Partnership Association on the subject of "Tendencies in Modern Industries."

DOUBTLESS one of the tendencies is a growing development of the worker becoming capitalist. This tendency is perhaps more marked on the other side of the Atlantic than it is in Europe. The number of workmen shareholders in America is very striking, and anyone who has studied the figures recently is more and more impressed with that fusion of interests, which is taking place to so considerable an extent. In spite of the relatively quiet time existing in American industry to-day, as far as industrial disputes are concerned, the working man, feeling a direct personal interest in the result of the year's working, is naturally not anxious to disturb the profit and loss account of the company. That is one of the important effects of this movement.

The Worker-Shareholder

I am glad to say that, since Imperial Chemical Industries, Ltd. has been formed, we have had a growing number of staff and workmen in the share-holding scheme which we have introduced. This scheme is at present under revision to make it still more effective. There are some people who are frightened that if workmen become shareholders they will ultimately get complete control and upset the decisions of the board. Personally I have no fear in that direction. On the whole, my experience is that our workmen are sufficiently educated and reasonable to leave the direction of companies to those who have been trained and tested in that capacity.

Undoubtedly one of the main tendencies is the great interest taken in modern industrial problems. It is all on the line of the work we have been doing on the Melchett-Turner Conference for the last eighteen months. What has been the leading line in that conference? The old idea of the controversy between capital and labour is obsolete, and co-operation between all engaged in industry is the only salvation of industry. This is one of the principal features in the results of our considerations, as expressed in the various memoranda. We have taken a great step forward, and the other questions that must necessarily arise in the minds of those engaged in industry in its different capacities become rather matters of detail.

The Highest Standard of Efficiency

In all industry there is an intense necessity for the highest possible degree of efficiency that human effort can obtain. It is impossible for human effort to reach 100 per cent. efficiency because we are none of us 100 per cent. efficient, and the aggregate is no more efficient than the individual. But, as far as the human factor allows, we have to reach the highest possible standard. There is an uneasy feeling among the workers that the people who are running industry are themselves inefficient, and it is really that feeling which is causing a certain amount of the disquietude which exists to-day. Modern industry is not prepared for inefficiency. Efficiency is the key-note to industrial life and must be understood in order to launch out in every possible direction. Efficiency of management, salesmanship, market and finance—all are necessary. A much higher standard to-day is required than when I first went into business, and the responsibility, anxiety and daily troubles of those who direct industries are little realised by many of those who think themselves much worse off because they have a less remunerative and lower position. But in reality the latter have a much happier life because they are free of this responsibility.

Some people have the idea that the tendencies which are developing are modern; they are not. They have grown more rapidly in recent times because the vast increase in consumption has demanded increased output and manufacture on a scale unheard of and unthought of a generation ago, and also because a great deal has had to be done, not always by choice but by necessity. Production to-day is capable of infinite expansion in a very short time. All these factors lead naturally to a difficult position—a struggle to maintain a balance between consumption and production. These problems have been forced by circumstance very largely upon the industries of this country. Some people do not like to see these great amalgamations—well, there is a good deal to be said on that side. One thing, however, is quite clear to those who deal with these matters, that it is quite impossible for a relatively small unit to maintain its position in the world, against the powerful combinations of efficiency and expert management.

Profits can easily be divided when there are profits to divide, but our difficulty is to divide the losses. Surely our first duty is to see in what way we can re-establish prosperity. Co-partnership and contentment are not easy to achieve when you are talking about longer hours and other obsolete conditions, but with renewed prosperity this becomes easy.

Industry must not be Dehumanised

There is a tendency to-day to overrate the value of money rather than the value of life itself; people are rather apt to look at industry merely from the financial point of view and not from the human side. We do not wish to see our industries becoming dehumanised. I hope that the old family business spirit will never be lost. I have endeavoured to keep, as far as is humanly possible, in contact with the workers, by means of works committees and councils. To obtain the willing and loyal co-operation of those engaged in the daily work of the factory is of inestimable value; accountants do not know of it, and taxing authorities—thank heaven—can never tax it. I am sure that the genuineness which characterises our people will enable us still to keep the old traditions under new methods. By that means we shall settle some of the most difficult problems by the harmonious co-operation of all concerned in industry.

Europe and America

I was recently having a talk with Mr. Schwab, the chairman of the Bethlehem Steel Works, who informed me that he produced as much steel in his works as is produced in the entire works of Great Britain. Very few people seem to realise that the United States Steel Corporation produces as much steel as the whole of Europe. How is Europe going to exist in the world's markets with dozens of exchanges, dozens of currencies, dozens of idiosyncrasies, while from the Atlantic to the Pacific there is only one language and one currency?

Let us also face the terrible problem of hundreds and thousands of people who are unemployed. The problem of unemployment is not known in other countries to the same degree because in other countries agriculture can absorb its people. How can we rectify this position? The balance between industry and agriculture in Britain has been upset. We can do much to improve British agriculture; modern scientific methods can do much. Great Britain has the great "Agricultural Hinterland" of the Empire to balance her over-rapid industrial development. It is only when you take a wider purview—it is only when you begin to think, not in terms of Great Britain but of the Empire, that you realise that the Empire is the agricultural ground for Great Britain. It has room for great populations, and it is still practically uninhabited.

The fundamental issue must lie with the British Empire, in its fullest extent, and I am glad to think that recent indications show that more and more leading men of the Dominions, together with statesmen, politicians and industrialists are coming to this conclusion. The difficulties of such schemes I need hardly repeat, but they can be overcome by goodwill and the desire to sit down and handle them. I cannot see why we cannot have a merger of the Empire just as we have mergers in industry. A merger of the Empire ought to be an easier proposition than in many of our industries. This movement towards the organisation of the British Empire as an economic unit is certainly one of the modern tendencies.

I have said that the tendencies in modern industry to-day are to amalgamate complexes of capital, national and international. The United States is itself a self-contained unit which had made such an arrangement. There is already apparent a desire among thinking people of Europe to see how they can arrive at something which will make their unit more capable of standing up against foreign competition. Great Britain will have to decide which road she is going to travel.

Chemical Trade Returns for June

THE Board of Trade Returns for June indicate that imports of chemicals, drugs, dyes and colours for the month were valued at £1,190,531, an increase of £20,980 on June, 1928; exports were valued at £1,843,941, a decrease of £341,561; and re-exports at £129,783, an increase of £49,983. For the six months ended June 30, imports were valued at £7,911,711, an increase of £49,014 on the corresponding period of 1928; exports were valued at £12,743,402, a decrease of £82,492; and re-exports at £491,344, an increase of £5,998. The details are as follows:—

Imports

	Quantities Month ended June 30,		Value Month ended June 30,	
CHEMICAL MANUFACTURES AND PRODUCTS—	1928.	1929.	1928. £	1929. £
Acid Acetic.....tons	1,215	1,479	56,237	54,294
Acid Tartaric.....cwt.	2,502	3,065	15,923	21,255
Bleaching Materials ,,	13,903	16,324	10,055	20,195
Borax ..... ,,	24,556	12,155	17,729	8,790
Calcium Carbide .. ,,	65,126	43,642	40,381	27,486
Coal Tar Products value	—	—	5,003	5,184
Glycerine Crude .. cwt.	6,865	600	24,575	900
Glycerine, Distilled ,,	30	309	122	759
Red Lead and Orange Lead ..... cwt.	2,761	3,885	4,258	5,576
Nickel Oxide ..... ,,	175	131	814	617
Potassium Nitrate ,,	9,760	8,699	9,969	8,784
Other Potassium Compounds .....cwt.	66,081	46,001	37,941	29,683
Sodium Nitrate .. ,,	47,278	99,342	24,290	50,476
Other Sodium Compounds .....cwt.	36,392	36,006	25,290	26,986
Tartar, Cream of .. ,,	3,291	3,085	15,112	13,848
Zinc Oxide ..... tons	1,019	1,059	31,262	31,148
All other Sorts....value	—	—	259,666	293,702
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	136,580	206,260	9,504	14,477
Bark, Cinchona, etc.cwt.	1,129	3,073	5,097	12,807
Other Sorts .....value	—	—	172,431	192,701
DYES AND DYESTUFFS—				
INTERMEDIATE COAL TAR PRODUCTS .....cwt.	75	256	543	3,421
Alizarine ..... ,,	31	150	675	9,089
Indigo, Synthetic .. ,,	—	—	—	—
Other Sorts ..... ,,	3,421	5,300	80,719	90,752
Cutch ..... ,,	3,062	5,339	4,985	10,228
Other Dyeing Extracts cwt.	3,181	3,500	9,892	11,358
Indigo, Natural .... ,,	—	26	—	705
Extracts for Tanning ,,	92,189	56,828	102,490	62,784
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground, and Blanc Fixe ..... cwt.	72,090	66,142	16,251	14,911
White Lead (dry) .. ,,	16,812	12,733	26,289	21,943
All other Sorts..... ,,	130,052	103,447	162,048	145,072
Total of Chemicals, Drugs, Dyes, and Colours ..... value	—	—	1,169,551	1,190,531

Exports

CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Sulphuric ....cwt.	13,416	7,303	4,195	2,542
Acid Tartaric .... ,,	3,016	914	20,639	6,286
Ammonium Chloride tons	303	239	6,824	4,536
Ammonium Sulphate—				
To Spain and Canaries tons	14,363	5,096	136,530	40,277
,, Italy..... ,,	195	789	2,053	7,632
,, Dutch East Indies tons	—	88	—	910
,, Japan..... ,,	8,203	11,832	81,689	119,712
,, British West India Islands and British Guiana tons	3,102	1,127	31,307	10,970
,, Other Countries ,,	13,905	20,960	142,904	210,297
Total .... ,,	39,768	39,892	394,483	398,798
Bleaching Powder .. cwt.	46,057	45,046	16,120	13,512
COAL TAR PRODUCTS—				
Anthracene .....cwt.	—	—	—	—
Benzol and Toluol.galls.	147,642	221,064	8,492	15,846
Carbolic Acid .... cwt.	20,092	15,237	35,397	22,411
Naphtha.....galls.	6,423	7,134	635	718
Naphthalene (excluding Naphthalene Oil) cwt.	906	6,068	685	2,908
Tar Oil, Creosote Oil, etc. ..... galls.	1,611,329	2,688,281	48,727	71,531
Other Sorts .....cwt.	84,074	20,334	40,344	13,473
Total ....value	—	—	134,280	126,899
Copper, Sulphate of ..tons	6,027	2,935	142,017	75,885
Disinfectants, etc.....cwt.	31,807	24,581	82,106	58,581
Glycerine, Crude .... ,,	1,234	1,493	4,272	2,017
Glycerine, Distilled .. ,,	7,633	6,284	27,485	15,829
Total .... ,,	8,867	7,777	31,757	17,846
POTASSIUM COMPOUNDS—				
Chromate and Bi-chromate ..... cwt.	2,073	1,142	3,800	2,309
Nitrate (Saltpetre) . ,,	935	975	1,783	1,879
All other Sorts .... ,,	1,822	2,227	13,990	9,317
Total .... ,,	4,830	4,344	19,573	13,505
SODIUM COMPOUNDS—				
Carbonate, Soda Crystals, Soda Ash and Bicarbonate .....cwt.	377,420	417,828	105,327	114,624
Caustic ..... ,,	171,289	145,174	114,060	94,527
Chromate and Bichromate ..... cwt.	6,246	1,397	8,285	2,294
Sulphate, including Salt Cake .....cwt.	103,389	158,680	12,016	18,034
All other Sorts .... ,,	64,480	43,894	77,610	38,910
Total .... ,,	722,824	766,973	317,298	268,389
Zinc Oxide ..... tons	138	116	5,634	4,408
Chemical Manufactures, etc., all other Sorts value	—	—	322,545	276,938
Total of Chemical Manufactures and Products...value	—	—	1,497,471	1,268,119
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	211,285	119,455	18,887	13,237
All other Sorts....value	—	—	242,636	206,455
Total .... ,,	—	—	261,523	219,692
DYES AND DYESTUFFS—				
Products of Coal Tar cwt.	9,719	12,515	75,109	71,559
Other Sorts ..... ,,	5,234	6,922	7,663	8,499
Total .... ,,	14,953	19,437	82,772	80,058
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground, and Blanc Fixe ..... cwt.	2,671	5,189	1,450	2,808
White Lead (dry) .. ,,	6,068	3,102	11,160	6,431
Paints and Colours, in paste form .....cwt.	47,014	27,135	97,867	54,735
Paints and Enamels Prepared (including Ready Mixed) .. cwt.	42,956	41,930	136,230	131,847
All other Sorts .... ,,	57,995	45,445	97,029	80,251
Total .... ,,	156,704	122,801	343,736	276,072
Total of Chemicals, Drugs, Dyes and Colours ... value	—	—	2,185,502	1,843,941

Re-Exports

	Quantities Month ended June 30		Value Month ended June 30	
CHEMICAL MANUFACTURES AND PRODUCTS—			£	£
Acid Tartaric ..... cwt.	70	71	599	575
Borax ..... ,,	257	657	256	560
Coal Tar Products, value	—	—	20	60,451
Potassium Nitrate .cwt.	201	90	335	82
Sodium Nitrate ... ,,	872	624	453	354
Tartar, Cream of .. ,,	358	977	1,780	4,533
All other Sorts....value	—	—	25,954	22,977
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts oz.	63,712	18,210	5,453	1,768
Bark Cinchona, etc. cwt.	278	433	1,108	3,051
All other Sorts....value	—	—	31,279	27,430
DYES AND DYESTUFFS—				
Cutch .....cwt.	1,474	735	2,440	1,262
Other Dyeing Extracts cwt.	452	92	2,187	1,268
Indigo, Natural.... ,,	5	—	124	—
Extracts for Tanning ,,	929	2,309	1,184	2,574
PAINTERS' COLOURS AND MATERIALS.....cwt.	1,904	892	5,583	2,599
Total of Chemicals, Drugs, Dyes and Colours ... value	—	—	79,800	129,783

"Silicosis"

To the Editor of THE CHEMICAL AGE.

SIR,—As there have been numerous references in the Press to the effect of the new Silicosis Regulations upon the paint and colour industry, I think the following facts may be of interest to your readers :—

The publication of the scheme caused considerable anxiety to all users of silica, owing to the fact that the insurance companies refused to carry the risk under their ordinary W.C.A. policy, and quoted an almost prohibitive rate for insurance under the scheme.

Under the regulations there is no difference made between large and small users of silica, with the result that many firms who use small quantities only, finding that the whole of their men will be liable under the scheme, have abandoned the use of silica entirely, however suitable it was to their individual needs.

It seems evident that the scheme is much too wide in its application. The consequent loss to the silica trade of all these small users is causing my association great anxiety. We have, therefore, decided to obtain the best medical opinion available to investigate the conditions attendant upon the use of silica in paint manufacture, and we have been able to secure the services of Sir Thomas Legge, late Senior Medical Inspector of Factories to the Home Office, who by the courtesy of one of our customers, was enabled to witness the actual process of the incorporation of silica at a paint works. He has sent us a report, which he has authorised us to make use of, as follows :—

"I visited Messrs. —— yesterday and saw a 2-cwt. sack of Milowite mixed with spirit in an edgerunner provided with a cover but not placed under a negative pressure. The Milowite was scooped out by hand into the pan—the whole operation lasting perhaps 20 minutes. The workman wore no respirator nor were the doors of the cover closed. The manager informed me that the amount of Milowite I saw dealt with would represent a quantity sufficient to last a week. Ordinarily a 5 cwt. quantity, together with at least an equal quantity of other materials, would be discharged into the pan through a shoot with the doors of the cover closed.

"I am satisfied that the operation, as I saw it, involved absolutely no risk of the workman contracting silicosis—let alone disabling silicosis. The idea is ludicrous in view of the minute quantity of the dust which is inhaled. As is known, silicosis is a slow developing condition and can only result from long continued (*i.e.*, months and months) employment necessitating, during working hours, inhalation of much fine silica dust. It is a question of degree, and as I saw the procedure no insurance office ought to dream of increasing the premium because of any imaginary risk of silicosis."

Your readers will be interested to observe that Sir Thomas Legge is of the opinion that there is no risk whatever attached to the use of silica in the paint trade.

In concert with the Paint Federation and the National Union of Manufacturers, my Association is about to make representations to the Home Office, with a view to the exemption of the Paint and Colour Industry from the Silicosis Regulations.—Yours, etc.,

For the SILICA MILLERS' ASSOCIATION,
FRED. A. CAMPBELL, Secretary.

Winsford, Cheshire, July 15.

Chlorophyll in Peat

To the Editor of THE CHEMICAL AGE.

SIR,—I note your reference (p. 31) to the discovery of chlorophyll in peat by the Pittsburgh Experimental Station of the United States Bureau of Mines, and I wish to put on record that I observed the presence of chlorophyll in peat from Sedgemoor, Somerset, as far back as 1922, a fact which I have so far not published.—I am, Sir, etc., M. NIERENSTEIN.

The University, Bristol.

Minister for Overseas Trade

Mr. Gillett's Task

MR. GILLETT, the Quaker banker, whose appointment as Minister for Overseas Trade is the first direct link between the Department of Overseas Trade and the City, has a busy time ahead of him. Among other matters for his attention are the appointment of new Trade Commissioners, the advisability of increasing the number of commercial diplomatic posts, the future of the British Industries Fair, which enters upon a new phase by moving to the reconstructed Olympia next year, and the development of the export credits scheme, with which Mr. Gillett is already familiar as a member of the advisory committee concerned with that particular branch of the Department's activities.

All this, of course, is over and above the considerable amount of work involved in directing the regular routine of the Department in gathering and correlating commercial information, calling attention to market opportunities, making investigations for manufacturers who wish to export to countries where they have no representatives of their own, and so on.

There is a spirit of optimism in the Department, for the time and evident care taken by Mr. MacDonald in choosing as its head a man in close touch with the business community is interpreted as evidence of the Government's intention to make full use of the Department in the campaign to reduce unemployment, and reference may be made to this at the luncheon which the proprietors of Olympia are to give next Friday (July 19) as a means of launching the idea of Olympia as the future home of the British Industries Fair in London.

Ambassadors of Commerce

The vacancies for the new Trade Commissioners are created by the decision (following an investigation by Mr. Beale, until recently Trade Commissioner in New Zealand and now director of the Travel Association of Great Britain) to re-open the Singapore post, which was closed down for reasons of economy in 1922, and to appoint a second-in-command at Sydney so as to allow the Senior Commissioner there to travel more widely in Australia than he has been able hitherto.

The question of creating more commercial diplomatic posts in foreign countries is being held over until after Lord D'Abernon's mission to the Argentine has reported, as it is expected that knowledge of the conditions there will be valuable in forming a judgment as to the advisability of having more commercial diplomatic officers in other parts of the world.

Tin Producers' Association to be Formed

AT a meeting attended by over 300 directors and delegates of tin-producing companies, representing the greater part of the Empire's production, held on Thursday, July 11, at the Cannon Street Hotel, London, under the presidency of Sir Edmund Davis, it was unanimously resolved to form a Tin Producers' Association. One hundred and sixty-seven tin-producing companies, having a total annual production of 100,000 tons of tin ore, were represented. After the decision to form the association, a provisional council of 21 members was elected.

China Clay Exports—June, 1929

A RETURN showing the quantities and value of the exports of China Clay, the produce of Great Britain and Northern Ireland, from Great Britain and Northern Ireland, as registered in the month of June, 1929, is as follows :—

COUNTRY OF DESTINATION.	QUANTITY. Tons.	VALUE. £
Finland	2,877	6,299
Estonia	707	1,371
Latvia	1,019	1,505
Sweden	2,879	6,222
Norway	2,405	4,008
Denmark	764	2,045
Germany	2,615	5,394
Netherlands	4,102	9,370
Belgium	6,588	12,170
France	4,515	8,391
Switzerland	285	450
Portugal	20	78
Spain	1,085	1,971
Italy	1,325	3,332
China	23	122
United States of America	15,775	37,433
Mexico	15	65
Chile	10	48
Irish Free State	7	34
British India, via Bombay	828	3,738
Via Madras	25	110
Via Bengal, Assam, Bihar and Orissa	280	1,167
Straits Settlements and Dependencies	—	1
Malay Federated States	5	32
Australia	12	74
New Zealand	6	54
Canada	282	1,466
Total	48,454	106,950

China Clay Imports—June, 1929

A RETURN showing the quantities and value of China Clay, including China Stone, imported into Great Britain and Northern Ireland, as registered in the month of June, 1929, is as follows :—

COUNTRIES WHENCE CONSIGNED.	QUANTITIES. Tons.	VALUE. £
United States of America and total	25	160

Ramsay Memorial Fellowships

THE Ramsay Memorial Fellowship Trustees have made the following awards of new Fellowships for the session 1929–1930: A British Fellowship, tenable for two years, to Mr. O. H. Wansborough-Jones, B.A., for work at the University of Cambridge; a British Fellowship, tenable for one year only, to Mr. R. J. Phelps, B.Sc., for work at the University of Oxford; a Canadian Fellowship to Mr. L. M. Pidgeon, B.A., M.Sc., Ph.D., for work at the University of Oxford; a Japanese Fellowship to Professor Y. Nagai, for work at University College, London; a Spanish Fellowship to Don Andres Leon y Maroto, for work at University College, London; a Swedish Fellowship to Mr. E. K. Troell, Phil.lic., for work at the Rothamsted Experimental Station, Harpenden.

The Trustees have renewed the following Fellowships for the session 1929–30:—Mr. H. Bienfait, Ph.D. (Netherland Fellowship), for work at the Imperial College of Science and Technology, London; Mr. Peter Maitland, B.Sc., Ph.D. (Glasgow Fellowship), for work at the University of Cambridge.

Sir Robert Waley Cohen, K.B.E., has been appointed vice-chairman of the Trust, in the place of the late Sir John Brunner, and Mr. Henry Mond, M.P., has been appointed a trustee.

Sale of China Clay Township

NEGOTIATIONS, it was reported recently, have been conducted for the purchase from the Blamey Trustees of nearly the whole of the little town of St. Blazey in Cornwall. St. Blazey is in the famous China Clay area, and has a railway station where there are the extensive works and chief depots of the Cornwall minerals district branch of the Great Western Railway. The whole estate will be resold by auction in lots in September next. There are nearly 300 houses and shops, the old Town Hall, and several farms and small holdings.

Chemical Notes from Westminster

Questions in the House

IN reply to a question by Mr. Oliver (House of Commons, July 10) as to the necessity of experiments on living animals with the object of testing the efficacy of poison gas, Mr. Shinwell said that these experiments with animals had been carried on for many years at the Chemical Warfare Experimental Station, Porton, and he was advised that they were essential in order to obtain the necessary data for ensuring adequate defence against poison gases and for evolving efficient methods of treating human beings who become gas casualties.

A statement given by Mr. Shaw (July 11), in reply to a question by Mr. Graham-White on the subject of chemical warfare experiments, showed that the number of animals and birds used for experimental purposes at Porton during the period November 1, 1926, to July 8, 1929, was 1,355, of which 451 had been killed in the course of the work. In addition, certain experiments, Mr. Shaw stated, had been carried out at the Physiological Laboratory, Cambridge, the figures relating to which he would obtain and send to Mr. Graham-White.

Mr. N. Buxton in reply to a question by Mr. Smithers (House of Commons, July 15), regarding the consideration of recent scientific discoveries, and the use of nitro chalk and other chemical products in any future scheme for the improvement of agriculture, said that the Ministry of Agriculture was constantly engaged in promoting scientific research in agriculture and the application of the results of research, and special attention was at the present time being given to the treatment of grass land with nitrogenous fertilisers. By means of numerous publications of many kinds intended for different classes of readers, through the agency of the newspaper press, wireless and correspondence, and especially through the activities of the staffs of research institutes and agricultural colleges and the agricultural staffs of the county councils, every effort was being made to bring to the notice of the farming community the most up-to-date information with regard to advances in agricultural practice.

Mr. D. G. Somerville asked the Under-Secretary of State for the Colonies (House of Commons, July 15) whether British Honduras proposed to prohibit, except under licence, the importation of certain dyes and dyestuffs which are not products or manufactures of any part of the British Empire; whether this policy was being adopted by other Colonies; whether the Colonial Office recommended to British Colonies that they should adopt a policy of this nature; and, if not, whether it would consider the desirability of doing so.

Mr. Lunn replied that ten years ago a number of British dependencies, including British Honduras, on the invitation of His Majesty's Government, passed legislation prohibiting the importation, without licence, of certain dyes and dyestuffs not the produce or manufacture of any part of the British Empire. This legislation, so far as he was aware, remained unrepealed. He had no intention, he said, of recommending that other British Colonies should adopt a similar policy.

Mr. H. T. Tizard Leaving the D.S.I.R.

MR. HENRY THOMAS TIZARD, C.B., F.R.S., has accepted the invitation of the Governing Body to undertake the Rectorship of the Imperial College of Science and Technology, as from the beginning of September, in succession to Sir Thomas Holland. Since 1927 Mr. Tizard has been Permanent Secretary of the Department of Scientific and Industrial Research.

Appointments Vacant

An assistant chemist (woman), for the Air Ministry, Kidsbrooke.—The Secretary (I.G.). Air Ministry, London.

Two junior assistants, one in physics and one in chemistry, under the British Boot, Shoe and Allied Trades Research Association, 19, Bedford Square, London.

Assistant lecturer in chemistry at University of Birmingham.—C. G. Burton, The University (July 31).

From Week to Week

THE PRINCE OF WALES will make a tour of inspection of the Branston artificial silk works when he visits Burton-on-Trent on July 23.

DR. W. H. COATES, D.Sc., LL.B., treasurer to Imperial Chemical Industries, Ltd., was appointed a director at a board meeting of the company held on Thursday, July 11.

RECENT WILL: Sir Charles Tertius Mander, Bart., of The Mount, Tettenhall, Staffs., and of Mander Bros., Ltd., left gross estate of the value of £258,160, with net personalty £157,612.

CAPTAIN J. E. C. LANGHAM has relinquished his post as station director at Plymouth for the British Broadcasting Corporation to become manager of the developing and printing works of Colour Snapshots, Ltd.

THE MOND NICKEL CO.'s works at Clydach, Swansea, are reported to have paid, last week, over £110,670 to 1,329 workmen under their profit sharing scheme, each person being credited with an average of £83 in War Savings Certificates.

WESTERN VISCOSE SILK MILLS, at an extraordinary general meeting held in Bristol on Tuesday, decided, with a view to the disposa of the undertaking, to go into voluntary liquidation, and Mr. C Hewetson Nelson, of Liverpool, was appointed as liquidator.

THE WHOLESALE STAFF of Stone and Son, Ltd., manufacturing chemists, Exeter, had their annual outing on Saturday, when, accompanied by Mrs. Stone and other members of the family and the managing director, Mr. J. F. Fleetcroft, the party visited Bournemouth.

MR. NORMAN SINGERS GRACE, B.Sc., of the University of Saskatchewan, Saskatoon, Canada, has been elected by the trustees of the Beit Fellowships for Scientific Research to a Fellowship, tenable at the Imperial College of Science and Technology for two years, of the value of £250 per annum. The subject of his research is "Physical Chemistry."

THE CHILEAN NITRATE OF SODA PRODUCERS' ASSOCIATION announce that the selling prices and conditions of sale for Chilean nitrate of soda in Great Britain and Ireland for July 13 to July 31, 1929, are the same as those ruling for June, 1929. The scheme of price protection on stocks in the hands of dealers on July 13, 1929, will therefore be extended until July 31, 1929.

THE MANCHESTER CORPORATION Gas Committee on Wednesday decided to recommend the City Council to appoint Mr. A. L. Holton, the present manager of the Bradford Road works, as chief engineer of the department, at a salary of £1,750 a year. Mr. Holton has been in the service of the department for the past twenty-seven years, having joined the staff in 1902 as a chemist. He was appointed superintendent of the chemical plant in 1914.

DR. J. D. BENJAFIELD, the well-known bacteriologist, who has scored so many successes in motor racing events at home and abroad, and who is a member of the committee of the British Racing Drivers' Club, has just joined the board of the Accurate Recording Instrument Co., Ltd., of Manor Road, Teddington. This firm of precision instrument manufacturers is embarking upon the production of a device patented by Dr. Benjafield for controlling the temperature of the water in motor-radiators.

IN A PROGRESS REPORT, issued by Illingworth Carbonisation Co., Ltd., the directors state that they expect to have at least seven plants under construction by the end of the year. The Pearson and Dorman Long plant will be working towards the end of the year and steady progress is being made with the installation both on the carbonisation and by-products side. The Pease and Partners installation at Allerton Main Colliery is proceeding very satisfactorily. The board are confident that this plant will prove of the highest value in demonstrating the unique ability of the process to deal with all types and sizes of coal.

GROUP LIFE ASSURANCE policies for £100 each have been arranged by the United Glass Bottle Manufacturers, Ltd., for the 3,500 works employees at their various plants. The assurance is issued without medical examination, and costs the employee 3d. weekly, the balance of the cost being met by the company. The scheme was announced a few days ago and became effective on June 28, when more than 75 per cent. of all eligible employees signified their desire to join in this benefit. The total assurance covering this group of workers on the day the scheme became effective reached the large sum of £256,300, and will increase as more join the scheme.

THE FIFTY-THIRD ANNUAL REPORT of H.M. Inspectors of Explosives, being their Annual Report for the year 1928, which has just been issued (H.M. Stationery Office, price 1s.) records that no serious irregularity came to the notice of the inspectors during the manufacture of explosives. There were 94 accidents in manufacture causing 10 deaths and injuries to 17 persons. The total number of accidents was one less than in 1927; in 1928 the number was 336, causing 35 deaths and injuries to 301 persons. Compared with 1927 the deaths decreased by 5 and the people injured by 64. The average figures for the ten years 1919 to 1928 are, generally speaking, below those for the ten years 1904 to 1913.

THE SHAREHOLDERS of the Vereinigte Glanzstoff Co., at a meeting in Elberfeld on July 11, approved of the fusion with the Enka Co.

MR. PHILIP E. HILL, chairman of the Veno Drug Co. (1925), has been appointed a director of Mond Staffordshire Refineries, Ltd.

DURING A STRIKE riot at a chemical fertiliser factory in Athens last week, two policemen and one striker were injured, and five strikers were arrested.

THE DISTILLERS' CO., of Edinburgh, have sent a contribution of £5,000 to the Haig Memorial Fund in Edinburgh and a similar sum to the Fund in London.

DR. WILLIAM HUME-ROTHERY has been elected to the Armourers' and Brasiers' Company's research fellowship in metallurgy, in succession to Dr. Constance F. Tipper.

ASSOCIATED DYERS AND CLEANERS, LTD. have purchased the business and goodwill of Stevenson Bros. (Dundee), Ltd., cleaners, dyers and launderers, of Dundee and Aberdeen.

A QUALIFIED CHEMICAL ENGINEER is required in the Liverpool district to design special automatic packing and conveying plant for chemical works, at a commencing salary of about £350. (See page xxiv.)

IN CELEBRATION of his success in the recent General Election, Mr. Henry Mond, M.P. and Mrs. Mond have invited their supporters in the divisional organisation to a day's outing at Blackpool to-day (July 20). The company will number about 1,500.

CONSIDERABLE DEPOSITS OF BAUXITE have been discovered on the Gold Coast, in the Yehanin district, west of Kumasi, and the water-power resources of the district are sufficient for the working-up of the mineral. The amount is estimated at 180 million tons.

SIR IVOR PHILIPPS, the chairman of Non-Inflammable Film Co., in a circular, states that he hopes to be able to give a full account of the present position and prospects of the company at the annual meeting, to be held at the Caxton Hall, Westminster, London, on July 23, at 12 noon.

LOW TEMPERATURE CARBONISATION, LTD., following upon the company's operating expansion, is offering to shareholders the right to subscribe to one new 2s. share for every five old shares held. Any shares not applied for are to be taken up by the board at par, without commission.

THE BEMBERG COMPANY, it is stated, is to erect, in co-operation with the Comptoir de Textiles Artificielles, new factories at Roanne, France, and factories for the production of "Kupfer-Ammon" silk are also to be erected at Troyes. Additional works in the neighbourhood of Brussels and at Saint Ghislain are also contemplated.

THE WOODALL-DUCKHAM Vertical Retort and Oven Construction Co. (1920), Ltd., have received orders for three Woodall-Duckham circular tunnel kilns, one for Shanks and Co., Ltd., at Barrhead, one for Doulton and Co., Ltd., at the Royal Doulton Potteries, Burslem, and the third, a repeat order, for Southhook Potteries, Ltd., at Kilmarnock.

THE FOUR TANKS recently manufactured by Thompson Bros. (Bilston), Ltd., Bradley Works, Bilston, and supplied to Docker Bros., are of cylindrical shape, 9 ft. internal diameter and approximately 28 ft. 6 in. overall. They are constructed of ¼ in. plate, and electrically welded throughout. The tanks are arranged with angle iron base ring and bolted to a concrete foundation, whilst the staging consists of mild steel tees and channels and chequer plating together with tubular handrail. The tanks contain linseed oil and turpentine, and are of 10,000 gallons capacity.

UNIVERSITY NEWS:—*Sheffield.*—Mr. F. S. Hawkins, B.Sc., Ph.D. (London), has been appointed assistant lecturer in Chemistry. *Edinburgh.*—The following appointments have been made:—Mr. James Baddeley (British Dyestuffs Corporation, Manchester), Professor John Read (University of St. Andrews), Professor F. M. Rowe (University of Leeds), Professor R. W. Whytlaw-Gray (University of Leeds), examiners of theses for the degree of Ph.D.; Dr. E. B. Ludlam and Dr. J. A. V. Butler (Lecturers in Chemistry), Carnegie Teaching Fellows for the academical year 1929-30; Mr. William D. Burnet, the Distillers Company Studentship in Technical Chemistry for the year 1929-30. *London.*—D.Sc. degrees in Chemistry have been conferred on Mr. J. E. G. Harris (University College) and Mr. A. J. Turner.

AT THE INTERNATIONAL AERO. EXHIBITION, Olympia, July 16 to 27, Nobel Chemical Finishes, Ltd., a branch of Imperial Chemical Industries, Ltd., have their stand on the ground floor of the Main Hall. The company are displaying products of Nobel Chemical Finishes, as applied to aircraft manufacture, including clear oil varnishes, stoving enamels, crystallising enamels, dope-resisting paints, air-drying pigmented varnishes, glossy stoving enamel, grey-green anti-glare oil paint for cockpits, different types of undercoats, and also aeroplane dope and other similar products. There are on view parts of an aeroplane treated with the company's various finishes, and one exhibit shows the doping scheme which has been used on the new airship R. 100. Representatives of the company are in attendance to give information and answer enquiries.

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Bentonite: its natural state, extraction, properties and utilisation. J. H. Frydlender. *Revue des Produits Chimiques*, May 31, pp. 325–328, and June 15, pp. 357–362.

ORGANIC.—Benzanthrones. J. Martinet and A. Drobatscheff. *Chimie et Industrie*, June, pp. 1149–1160.

Natural camphor and its synthesis. A. Dubosc. *Revue des Produits Chimiques*, June 30, pp. 393–397.

Industrial preparation of vanillin. L. Maugé. *Industrie Chimique*, June, pp. 302–305.

Naphthisoindigotins. A. Wahl and J. Lobeck. *Comptes Rendus*, June 24, pp. 1683–1685.

PIGMENTS.—White titanium oxide pigments. A. Vila. *Technique Moderne*, July 1, pp. 397–402.

RAYON.—Properties, analyses and practical examination of cellulose acetates. M. Deschiens. *Chimie et Industrie*, June, pp. 1131–1140.

The strengthening of viscose (*concluded*). L. Meunier and R. Guyot. *Revue générale des Colloides*, March, pp. 106–117.

RESINS.—The examination and analysis of phenol-formaldehyde resins. A. B. Lorges. *Revue des Chimie Industrielle*, May, pp. 130–133.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

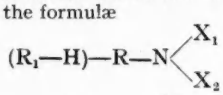
Abstracts of Complete Specifications

313,418. ALIPHATIC ANHYDRIDES, MANUFACTURE OF. H. Dreyfus, Celanese House, 22 and 23, Hanover Square, London, W.1. Application date, January 10, 1928.

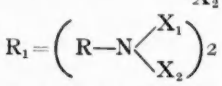
Aliphatic anhydrides, particularly acetic anhydride, are obtained by heating a mixture of aliphatic acid vapour with 5—20 per cent. of sulphur dioxide. The reaction is effected at 200°—600° C. by passing the mixture through fireclay or fused silica tubes filled with carborundum, pumice, or kieselguhr. The anhydride produced may be separated from water vapour by fractionating at a temperature between the boiling points of the anhydride and water. Or the gases may be passed through a solvent for the anhydride which is insoluble in water and of a higher boiling point than water, so that the anhydride is condensed and water escapes. Such solvents include chlorbenzene, paradichlorbenzene, benzyl ether, tetrachlor-ethane, paraffin oil, triacetin, phenetol, anisol, cresols, and paracresyl acetate. Several other methods of extracting the anhydride are described.

313,421. CONDENSATION PRODUCTS FROM ALICYCLIC RING KETONES, MANUFACTURE OF. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 7, 1928.

These condensation products are obtained by allowing an aromatic amine in which the para-position to the amino group is free to act at an elevated temperature on an alicyclic ring ketone or alkyl derivative in the presence of an acid. Alternatively, a salt of an aromatic amine may be directly condensed with the alicyclic ring ketone or an alkyl derivative. Primary, secondary, and tertiary bases having a free para-position to the nitrogen atom are suitable, and the alicyclic ring ketones may be cyclo-hexanone, cycle-pentanone, and their homologues, while the acid may be hydrochloric, sulphuric, oxalic, and benzene-sulphonic. The condensation products may contain either one or two amine residues in the molecule and have the formulæ



or



in which R is an aromatic residue which may contain further substituents, R_1 is an alicyclic hydrocarbon residue, X_1 and X_2 are hydrogen, or alkyl or arylkyl groups. Mixtures of the two- and three-nuclear products are obtained, which may be separated into their components by fractional distillation, or treatment with organic solvents, or by crystallisation of their salts. A three-nuclear condensation product may be converted into a two-nuclear condensation product by heating alone, or with an acid or acid salt. Examples are given.

313,426. ORGANIC DEHYDRATION REACTIONS, CARRYING OUT. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 8, 1928.

Organic reactions in which water is split off are effected by treating the initial material with highly active dehydration catalysts obtained by activating non-vitreous alumina by depositing on it small amounts of oxides of the heavy metals, expecially those of groups 1, 6, 7, or 8 of the periodic system, or substances which are converted into these oxides under the working conditions. In addition to these activators, substances having a dehydrogenating action, such as nickel, copper, or silver, or sulphides, selenides, or phosphides may be used. Activators which may be used include oxides of copper, chromium, manganese, and nickel. The catalysts are preferably used on carriers such as pumice, in which case the reaction temperature is reduced. Examples are given of the production of the catalyst, and of its use in converting *n*-butyl alcohol into butylene, methyl butenol into isoprene, amyl alcohol into amylene.

313,466. ALDOL OR CROTONALDEHYDE, PRODUCTION OF. G. F. Horsley, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Imperial Chemical House, Millbank, London, S.W.1. Application date, February 6, 1928.

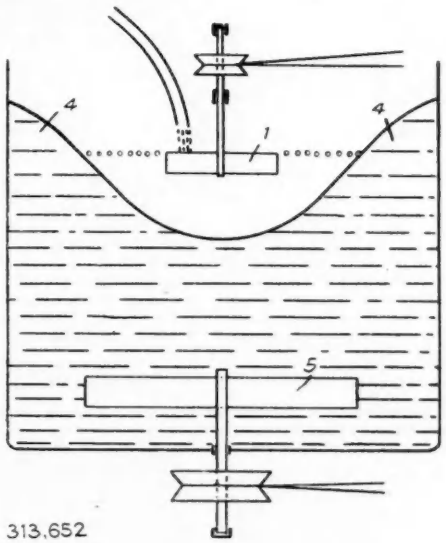
Acetaldehyde is condensed to aldol with exclusion of oxygen in neutral or very faintly alkaline solution such that the concentration of hydroxyl ions is not greater than 1/100,000th of normal. A metal acetate such as sodium acetate, which may or may not act as a condensing agent, may be added, with an amount of acetic acid sufficient to depress the concentration of hydroxyl ions to the neutral point, or as indicated above. The acetate ions minimise the effect of increase in the acetic acid concentration which might occur by oxidation of the acetaldehyde if any oxygen were present. The solution obtained may be acidified, and croton aldehyde obtained by distillation.

313,467. CATALYTIC CONVERSION OF MIXTURES OF CARBON MONOXIDE AND HYDROGEN INTO ORGANIC COMPOUNDS CONTAINING MORE THAN ONE CARBON ATOM. J. Y. Johnson, London. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 9, 1928. Addition to 266,405.

Mixtures of carbon monoxide and hydrogen containing little or no additonal gases are employed for the synthesis and excessive temperature, deposition of carbon, or formation of methane are prevented by carrying out the operation in a circulatory system, and other gases such as nitrogen, methane, or ethane are added in the proportion of at least 40 per cent., before or during the reaction. The lowering of the partial pressure of carbon monoxide and hydrogen may be compensated by raising the total pressure. The process is applicable to the production of liquid hydrocarbons, and also acids, esters, alcohols and ketones.

313,652. CONVERSION OF SALTS SUCH AS FERTILIZERS INTO GRANULAR FORM. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges. Frankfort-on-Main, Germany. Application dates, March 16, July 23 and September 14, 1928.

In the production of granular fertilisers by allowing the fused material to fall in drops into a cold liquid, it is necessary



313,652

that the drops should become solid during their passage through the liquid. In this invention, the molten drops are kept in suspension for sufficient time by projecting them into rapidly rotating liquid. The cooling liquid may contain chalk,

gypsum, clay, talc, kieselguhr, magnesium silicate, etc., to coat the solidified drops and prevent them from adhering. Paraffin oil or wax may also be dissolved in the cooling liquid to provide a waterproof coating on the granules.

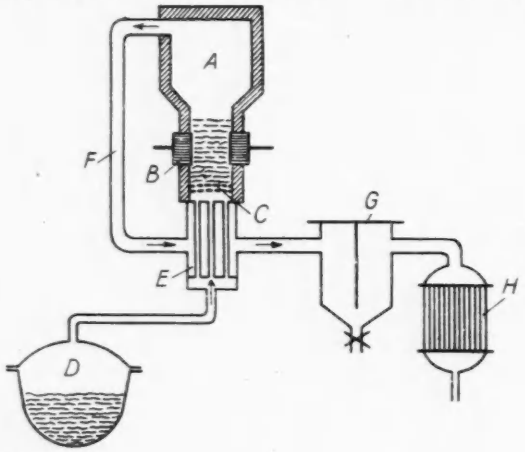
The melted substance is poured on to the rotating disc 1 and the particles are projected into the liquid 4, the upper surface of which partly encloses the disc 1 due to the rotation of the liquid by the stirrer 5 or otherwise.

313,651. ALIPHATIC ACIDS, MANUFACTURE OF. H. Dreyfus, Celanese House, 22 and 23, Hanover Square, London, W.1. Application date, March 16, 1928.

Alkyl ethers of hydroxy aliphatic acids are obtained by reacting on alkyl ethers with carbon dioxide, with or without catalysts. Thus methoxy acetic acid may be obtained by treating dimethyl ether with carbon dioxide, and ethoxy propionic acid by treating diethyl ether with carbon dioxide. The pressure may be 100—250 atmospheres, and temperature 300°—400° C. Suitable catalysts include inorganic acids, which may contain organic groups, *e.g.*, boric, arsenic, or phosphomolybdic acid, phosphoric acids, aluminium phosphate, oxides of aluminium, vanadium, titanium, alkali alcoholates, and alkali formates. The alkyl ether may be produced simultaneously with the above reaction, *e.g.*, methyl alcohol and sulphuric acid may be heated and carbon dioxide passed through the mixture.

313,756. OBTAINING GASEOUS AND LOW BOILING OLEFINES AND DIOLEFINES FROM BITUMINOUS COAL, TARS, MINERAL OILS, ETC. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 23, 1928. Addition to 268,599.

Specification No. 268,599 (see THE CHEMICAL AGE, Vol. XVI, p. 467) describes a process for the uniform heating of



313,756

granular substances, and it has been found that this is particularly suitable for the production of olefines and diolefines from carbonaceous material. In the shaft furnace A granular coal rests on firebrick lying on the grate C. Tar is vaporised in the still D and the vapour passes through heat regenerator E, and then through the grate C to maintain the coal in a state of agitation. The temperature of the furnace is kept at 650° C. by an electric current passed between the electrodes B. The gases pass through pipe F to the regenerator E and then to dust separator G and cooler H, where low-boiling hydrocarbons are condensed. Another apparatus for producing olefines from brown coal is described.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: —287,179 (I.G. Farbenindustrie Akt.-Ges.) relating to condensation products of the benzodiazine series, see Vol. XVIII, p. 495; 294,626 (I.G. Farbenindustrie Akt.-Ges.) relating to concentration of acetic acid, see Vol. XIX, p. 323; 301,491 and 301,799 (Selden Co.) relating to catalytic apparatus, see Vol. XX, pp. 130 and 159; 304,585 (A. Wacker Ges. für Electrochemische Industrie Ges.) relating to metal alcoholates, see Vol. XX, p. 320; 308, 566 (T. Benckiser, A. Reimann, sen., and A. Reimann, jun.) relating to disodium phosphate having two molecules of water of crystallisation, see Vol. XX, p. 508.

International Specifications not yet Accepted

311,283. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 8, 1928.

An aminoanthraquinone or a derivative or substitution product is caused to react with a polyhalogen anthraquinone acridone containing halogen in the phenyl residue, and a halogen atom in the 4-position of the anthraquinone nucleus, in a high boiling solvent and in the presence of an acid fixing agent and a copper catalyst. The products are dianthraquinonyl-amines of the anthraquinone-acridone series, and are vat dyes. They may be treated with condensing agents.

311,661. DYES AND INTERMEDIATES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, May 12, 1928.

Benzanthrone is oxidised with manganic sulphate in sulphuric acid, to a dioxy-dibenzanthronyl. This may be methylated to obtain a dimethoxy derivative, or converted into vat dyes by treating with alkaline condensing agents. The dyes can be alkylated or halogenated to obtain fast vat dyes. Examples are given.

311,707. ETHYL ACETO-ACETATE AND OTHER ESTERS. Dr. A. Wacker Ges. für Elektrochemische Industrie Ges., 20, Prinzregentenstrasse, Munich, Germany. International Convention date, May 14, 1928.

These esters are obtained by heating an ester such as ethyl acetate with an alkali metal alcoholate and distilling off the liberated alcohol. An example is given employing ethyl acetate and sodium ethylate.

311,708. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 14, 1928.

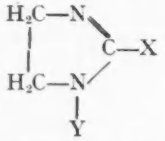
Diazotized 4-nitro-1-aminobenzene-2-sulphonic acid is coupled with a 2-alkylamino-naphthalene sulphonic acid, in which the alkyl residue contains more than two carbon atoms, *e.g.*, 2-isobutyl-, or 2-*n*-butylamino-naphthalene-7-sulphonic acid and 2-butyl- or 2-amylamino-naphthalene-6-sulphonic acid.

311,725. AMMONIA AND AMMONIUM SULPHIDE. C. J. Hansen, 33, Trappenbergstrasse, Essen, Germany. (Assignee of H. Koppers Akt.-Ges., Postfach, Essen, Germany.) International Convention date, May 15, 1928.

Thiocyanates are heated with water under pressure to 250°–300° C. or by blowing superheated steam at 200° C. through the solution. Ammonium thiocyanate yields ammonia sulphuretted hydrogen, and carbon dioxide. Ammonia, may be recovered by cooling, or the gases may be treated with lime to obtain ammonium sulphide. The spent liquor from the purification of coal gas may be treated in this manner.

311,735. INDIARUBBER. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 15, 1928.

Compounds having the general formula



where X is NH_2, NH (alkyl), N (dialkyl), NH (aryl), N (alkyl-aryl), or N (diaryl), and Y is H or alkyl, are used as vulcanization accelerators.

311,737. HYDROGEN. Lazote Inc., 1007, Market Street, Wilmington, Del., U.S.A. (Assignees of A. T. Larson, 1007, Market Street, Wilmington, Del., U.S.A.) International Convention date, May 15, 1928.

Hydrogen is obtained from carbon monoxide and steam by employing a catalayst containing copper and an oxide of zinc, tungsten, molybdenum, cerium, vanadium, manganese, uranium, chromium, and magnesium. The temperature may be 300°–600° C. and the pressure 10–100 atmospheres. The ratio of steam to carbon monoxide is at least 1·5 : 1. The catalyst is obtained by triturating, fusing, or precipitating a mixture of copper oxide with the other oxides, and is preferably treated with hydrogen at 100°–300° C. to reduce the copper. Details are given of the preparation of the catalyst.

LATEST NOTIFICATIONS.

314,972. Process for the conversion of ammonium thiocyanate and other thiocyanates into ammonium sulphate and sulphur. Hansen, Dr. C. J. July 6, 1928.

314,852. Process for manufacturing water-resistant heads and striking-surfaces for matches. I.G. Farbenindustrie Akt-Ges. July 3, 1928.

314,976. Manufacture of phosphoric acid and products containing phosphoric acid. Aktiebolaget Kemiska Patenter. July 7, 1928.

314,977. Manufacture of phosphoric acid and products containing phosphoric acid. Aktiebolaget Kemiska Patenter. July 7, 1928.

314,894. Manufacture of ammonia. Urbain, E. July 4, 1928.

314,858. Contact sulphuric acid process. Selden Co. July 3, 1928.

314,956. Production of ferri-cyanides. Schröter, J. July 5, 1928.

314,803. Process of preparing indanthrone dyestuffs. Newport Co. July 2, 1928.

314,804. Process of preparing 2-amino-3-substituted-10-anthrones and N-substitution products thereof. Newport Co. July 2, 1928.

314,810. Manufacture of synthetic resins. I.G. Farbenindustrie Akt.-Ges. July 2, 1928.

314,812. Purification of waste alkali liquors. I.G. Farbenindustrie Akt.-Ges. July 2, 1928.

314,872. Process for the preparation of substituted cyclohexylamines. Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges, et Camargue. July 3, 1928.

314,899. Process for the manufacture of condensation products of the anthraquinone-acridone series. I.G. Farbenindustrie Akt.-Ges. July 4, 1928.

314,903. Manufacture of dyestuffs. Soc. of Chemical Industry in Basle. July 4, 1928.

314,904. Process of printing with vat-dyestuffs. I.G. Farbenindustrie Akt.-Ges. July 4, 1928.

314,966. Process for refining crude hydrocarbon products such as benzol and similar materials. Otto and Co., Ges., Dr. C. July 5, 1928.

Specifications Accepted with Date of Application

282,688. Electrolytic apparatus. J. E. Noeggerath. December 21, 1926.

284,218. Preventing the formation of deposits on heat-exchange apparatus exposed to hot gases, Process and means for. Laboratoire de Perfectionnements Thermiques. January 24, 1927.

285,840. Azine dyestuffs, Manufacture of. Soc. Anon des Matières Colorantes et Produits Chimiques de Saint-Denis, R. Lantz, and A. Wahl. February 22, 1927.

287,577. Gaseous mixtures containing hydrogen, Process for the treatment of. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. March 25, 1927.

288,148. Low boiling point and other hydrocarbons and derivatives thereof, Production of, by the destructive hydrogenation of coals, oils, and the like, and the treatment of the residues thereof. I.G. Farbenindustrie Akt.-Ges. March 31, 1927.

288,291. Vat dyestuffs of the anthanthrone series, Process for the manufacture of. I.G. Farbenindustrie Akt.-Ges. April 9, 1927.

288,308. Phenol from chlorobenzene, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 6, 1927.

288,333. Alkali or alkaline-earth metals, Purification of, and the production of alloys therefrom. British Thomson-Houston Co., Ltd. April 6, 1927.

289,383. Fluorine compounds having a low silicon content, Process for the manufacture of. Verein für Chemische und Metallurgische Produktion. April 25, 1927.

291,435. Removing dissolved silicic acids from liquids, especially water. A. Rosenheim. June 4, 1927.

293,792. 4-amino-1-oxybenzene, and N-derivatives thereof, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 12, 1927.

294,117. Fertilizers containing nitrogen and phosphoric acid, Manufacture of. Elektrizitätswerk Lonza. July 14, 1927.

313,036. Leaching raw phosphate, Method of. Kunstdunger-Patent-Verwertungs-Akt.-Ges. June 5, 1928.

314,555. Aliphatic acid anhydrides, Manufacture of. British Celanese, Ltd., S. J. Green, and R. R. Widdowson. January 28, 1928.

314,593. Nitrogenous vat dyestuffs, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 4, 1928.

314,594. Electrodeposited protective coatings for vessels. I. Ainstein. February 4, 1928.

314,470 and 314,558. Electro-deposition of metals. Electro-Bleach and By-products, Ltd., and J. Hollins. February 25, 1928.

314,314. Non-corrosive and heat-resisting surfaces on iron, Process for producing. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 19, 1928.

314,460. Therapeutic calcium preparations, Process for the manufacture of. G. B. Ellis. (*Chemical Works, formerly Sandoz.*) March 27, 1928.

314,573. Aromatic nitro compounds, Reduction of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 29, 1928. Addition to 263,376.

314,579. Electrolytic recovery of metals. S. C. Smith. March 30, 1928.

314,639. Materials in granular forms, Production of. C. C. Smith and Imperial Chemical Industries, Ltd. May 9, 1928.

314,646. Esters. Consortium für Elektro-Chemische Industrie Ges. W. O. Herrmann, and H. Deutsch. May 14, 1928.

314,652. Nitrogenous dyestuffs, Manufacture and production of. I.G. Farbenindustrie Akt.-Ges. May 31, 1928. Addition to 285,502.

314,672. Azo-dyes, Manufacture of. Imperial Chemical Industries, Ltd., and R. Brightman. June 27, 1928.

314,697. Purification of crude or impure sulphur. Manchester Oxide Co., Ltd.,and R. H. Clayton. July 24, 1928.

314,725. Working-up potash salts, Process of. A. L. Mond. (*Rhenania Kunheim Verein Chemischer Fabriken Akt.-Ges.*) September 13, 1928.

Applications for Patents

Appareils et Evaporateurs Kestner. Mixtures of nitrate of ammonia and nitrate of lime. 21,365. July 11. (France, August 2, 1928.)

Bakelite Corporation and Wade, H. Polybasic-acid-poly-hydric alcohol-resins. 21,259. July 10.

—— Production of formaldehyde. 21,260, 21,263. July 10.

—— Moulding-mixtures. 21,261. July 10.

—— Manufacture of ornamented moulded articles. 21,262. July 10.

Calco Chemical Co., Inc. Making sulphur trioxide. 21,012. July 9. (United States, August 15, 1928.)

Carpmael, A. and I.G. Farbenindustrie Akt.-Ges. Production of non-inflammable substances. 20,980. July 8.

Du Pont de Nemours and Co., E. I., and Triggs, W. W. Disazo dyestuffs. 21,520. July 12.

Du Pont de Nemours and Co., E. I. Waterproofing-compositions. 21,133. July 9. (United States, July 9, 1928.)

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 21,201. July 10.

Heyl, G. E. Production of activated carbon, etc. 21,039. July 9.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of organic compounds. 20,934. July 8.

—— Production of porous metal oxides. 20,935. July 8.

—— Sizing, etc., agents. 20,936. July 8.

—— Conversion of hydrocarbons. 20,937. July 8. (July 7, 1928.)

—— Production of finely-divided metals from metal carbonyls. 21,208. July 10.

—— Production of carbon black, etc. 21,209. July 10.

—— Production of additional agents for motor fuels. 21,210. July 10.

—— Production of diammonium phosphate for fertilisers. 21,211. July 10.

—— Starting internal-combustion engines. 21,212. July 10.

—— Production of hydrogenated aromatic hydrocarbons, etc. 21,213. July 10.

—— Production of blue vat dyestuffs. 21,214. July 10.

—— Production of acetylene, etc., from hydro-carbons. 21,522. July 12.

—— Isolation of polymerisation products of diolefines. 21,523. July 12.

—— Production of glycerine. 21,524. July 12.

I.G. Farbenindustrie Akt.-Ges. Manufacture of ceramic bodies. 21,639. July 13. (March 25.)

—— Manufacture of shaped articles from cellulose derivatives. 21,203. July 10. (Germany, July 10, 1928.)

—— Photographic film spools. 21,206. July 10. (Germany, July 27, 1928.)

Imperial Chemical Industries, Ltd. Apparatus for measurement, etc., of colour. 20,993. July 8.

—— Destructive hydrogenation. 21,015. July 9.

—— Water-proofing compositions, etc. 21,132. July 9. (United States, July 9, 1928.)

—— Destructive hydrogenation of carbonaceous material. 21,147. July 10.

—— Production of acetylene. 21427. July 12.

Lloyd, G. F. Treating dyed fabrics. 21,109. July 9.

Mathieson Alkali Works. Hypochlorite compositions. 21,511. July 12. (United States, August 16, 1928.)

—— Hypochlorite compositions. 21,512. July 12. (United States, December 29, 1928.)

—— Hypochlorite compositions. 21,513. July 12. (United States, September 27, 1928.)

Soc. of Chemical Industrie in Basle. Manufacture of dyestuffs. 21,204. July 10. (Switzerland, July 10, 1928.)

—— Manufacture of $Bz_1 : Bz_1^1$dibenzanthronyl. 21,635. July 13. (Switzerland, July 13, 1928.)

—— Immunising textiles to direct-dyeing dyestuffs. 21,636, 21,637. July 13. (Switzerland, July 13, 1928.)

Victor Chemical Works. Manufacture of phosphate compounds. 21,067. July 9. (United States, July 23, 1928.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2 cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 6¾d. per lb. Crude 60's, 2s. 2d. per gall.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 8d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. Dark, 1s. 6d. to 1s. 7d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 7½d. to 2s. per gall. Firm. Pure, 2s. to 2s. 2d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, 6¼d. to 6¾d. per gall. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 2d. to 2¼d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8d.-. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent 90/190, 1s. to 1s. 3d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. to £14 10s. per ton. Quiet Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 40s. to 45s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy, prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 9d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CRESOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton.

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 10d. to 2s. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4¼d. to 5¼d. per lb.

LAMP BLACK.—£30 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£20 to £22 per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£10 to £13 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra

SULPHUR PRECIP. B. P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 6d. to 6s. 9d. per lb.

ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton ex wharf London, barrels free.

ACID, ACETYL SALICYLIC.—2s. 6d. to 2s. 8d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 4d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carraige paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. 1d. to 2s. 3d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 7d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE —5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.
BISMUTH CARBONATE.—8s. 9d. per lb.
BISMUTH CITRATE.—8s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 3d. per lb.
BISMUTH SUBNITRATE.—7s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 3d. per lb.
BISMUTH OXIDE.—11s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 3d. per lb.
BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W Qts. 11d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 1s. 11½d. per lb.; potassium, 1s. 8½d. per lb.; granular, 1s. 7¾d. per lb.; sodium, 1s. 10½d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 2½d. to 1s. 3½d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb. U.S.P., 2s. 9d. to 3s. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 20s. 6d. per lb. net; Synthetic, 12s. to 14s. per lb.; Synthetic detached crystals 12s. to 16s. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 5d. to 1s. 8d. per lb.
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—2s. 6d. to 2s. 9d. per lb.
PHENAZONE.—3s. 11d. to 4s. 2d. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—100s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 7d. per lb. in 1 cwt. lots.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—47s. per lb.; in quantity lower.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. 4d. per lb., B.P.C. 1923—2s. 7d. per lb. Prices for 1 cwt. lots. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. to 105s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 2s. 2d. to 2s. 5d. per lb. Crystal, 2s. 3d. to 2s. 6d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 1d. to 9s. 4d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—14s. per lb.
COUMARIN.—9s. per lb.
CITRONELLOL.—10s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—3s. per lb.
EUGENOL.—12s. 6d. per lb.
GERANIOL (PALMAROSA).—21s. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—14s. 3d. per lb.
LINALOL.—Ex Bois de Rose, 12s. 6d. per lb. Ex Shui Oil, 10s. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 16s. per lb. Ex Shui Oil, 12s. per lb.
METHYL ANTHRANILATE.—8s. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—34s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. per lb.
RHODINOL.—56s. per lb.
SAFROL.—2s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—18s. per lb. Ex Guaiacol, 15s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—3s. per lb.
BERGAMOT OIL.—18s. per lb.
BOURBON GERANIUM OIL.—22s. per lb.
CANANGA OIL, JAVA.—11s. 6d. per lb.
CASSIA OIL, 80/85%.—6s. 3d. per lb.
CINNAMON OIL LEAF.—9s. per oz.
CITRONELLA OIL.—Java, 2s. 8d. per lb., c.i.f. U.K. port. Ceylon, pure, 2s. 4d. per lb.
CLOVE OIL (90/92%).—9s. 6d. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 10d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 16s. 6d. per lb.
LEMON OIL.—17s. per lb.
LEMONGRASS OIL.—4s. per lb.
ORANGE OIL, SWEET.—20s. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
PALMA ROSA OIL.—12s. 6d. per lb.
PEPPERMINT OIL.—English, 87s. 6d. per lb.; Japanese, 7s. 3d. per lb.
PETITGRAIN.—8s. 9d. per lb.
SANDALWOOD.—Mysore, 30s. per lb.: 90/95%. 19s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, July 18, 1929.

CONDITIONS on the London Market have been fair, considering the period of the year, and prices continue steady with very little variation. On the export side more activity is shown :—

General Chemicals

ACETONE.— There has been a steady flow of inquiry, with demand satisfactory and price continuing firm at £75 to £85 per ton.

ACETIC ACID has been in brisk demand on a very short market ; supplies for near delivery are very scarce and the price is firm at £36 10s. to £37 10s. per ton, for 80% technical quality.

ACID CITRIC.—Demand has improved and the price is now firm at 2s. 2d. to 2s. 3d. per lb.

ACID FORMIC.—A fairly steady demand is on the market, with price unchanged at £42 per ton for 85%, in usual free carboys.

ACID LACTIC.—There is a steady trade passing at the firm price of £43 per ton for 50%, by weight, standard pale qualities.

ACID TARTARIC.—The market is firm at 1s. 4¾d. less 5%, with demand much brisker.

ALUMINA SULPHATE.—Conditions are firm at £7 15s. to £8 per ton, and in good demand.

ARSENIC.—There is only a small inquiry and the price is unchanged at £16 5s. per ton, f.o.r. mines.

BARIUM CHLORIDE.—Supplies still continue short, with the price firmly held at £12 per ton, ex store, for the little available supplies.

CREAM OF TARTAR.—An improvement in the demand is noticed, with the price firm at £98 to £100 per ton, for the 99/100% B.P. qualities.

COPPER SULPHATE.—Rather more business is on the market, with the price steady at about £26 per ton.

FORMALDEHYDE.—There is a good demand for spot and early delivery, with the price steady at about £38 per ton.

LEAD ACETATE.—Slightly lower prices are being quoted and this is increasing the demand. White is quoted at about £43 10s. and brown at about £42 10s.

LEAD NITRATE.—Rather slow at about £33 15s. per ton.

LIME ACETATE.—Supplies continue scarce on a very brisk market ; the price is firmer at £18 per ton.

LITHOPONE is steady at £19 15s. to £22 per ton, according to quantity and quality.

METHYL ACETONE.—A fairly satisfactory demand has been received, with the market remaining firm at £58 to £60 per ton.

POTASSIUM CHLORATE is in rather better request at about £28 to £30 per ton.

POTASSIUM PERMANGANATE.—The market is inclined to tend towards higher prices and there is a good demand.

POTASSIUM PRUSSIATE.—Rather more business is passing, with the price firm at £63 10s. to £65 10s. per ton.

SODA ACETATE CRYSTALS.—Supplies are still short, especially for first class material ; the price remains firm at £22 10s. to £23 per ton.

SODA BICHROMATE is in good request at 3⅜d., with discounts for contracts.

SODA HYPOSULPHITE.—There is a larger demand for the photographic pea crystals, which are firm at £14 10s. to £15 per ton.

SODA NITRITE.—There has been a larger inquiry and the price is firm at £20 per ton.

SODA PHOSPHATE.—There is a small trade in dibasic at about £12 and Tribasic at about £16 10s.

SODA PRUSSIATE is firm and in good request at 4¾d. to 5¼d. per lb. according to quantity.

TARTAR EMETIC.—More inquiry has been received, with the price ruling firm at 11d. per lb.

ZINC SULPHATE is in steady demand at about £12 per ton.

Coal Tar Products

Prices for coal tar products remain unchanged, the market showing no signs of improvement.

MOTOR BENZOL is quoted at 1s. 5½d. to 1s. 6d. per gallon, f.o.r. makers' works.

SOLVENT NAPHTHA is unchanged at about 1s. 2d. to 1s. 2½d. per gallon, f.o.r.

HEAVY NAPHTHA remains at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL is unchanged at 3½d. to 4d. per gallon on rails in the north, and at 4¼d. to 4½d. per gallon in London.

CRESYLIC ACID remains at about 1s. 10d. per gallon for the 98/100% quality, and at about 1s. 7d. per gallon for the dark quality 95/97%.

NAPHTHALENES are firm at about £4 10s. per ton for the firelighter quality, at £5 per ton for the 74/76 quality, and at £6 to £6 5s. per ton for the 76/78 quality.

PITCH.—Makers are asking 40s. to 42s. 6d. per ton, f.o.b. East Coast.

Nitrogen Products

Sulphate of Ammonia.—At present there is no business passing. The new season's prices have not yet been announced, and buyers meanwhile are holding back.

Nitrate of Soda.—The same remarks apply.

Latest Oil Prices

LONDON, July 17.—LINSEED OIL closed firm at a net loss of 7s. 6d. to 2s. 6d. per ton. Spot, £38, ex mill ; July, £34 ; August., £33 15s. ; September-December, £33 10s. ; and January-April, £33 5s., naked. RAPE OIL was steady. Crude extracted, £41 ; technical refined, £43, naked, ex wharf. COTTON OIL was firm and 10s. higher for crude Egyptian at £31. Refined common edible was quoted at £36, and deodorised at £38, ex mill. TURPENTINE was steady. American, spot, 43s. 9d. ; July, 43s. 6d. ; and August-December, 43s. per cwt.

HULL.—LINSEED OIL, naked, spot, £35 5s. : July, £34 10s. ; August, £34 5s. ; September-December, £33 15s. COTTON OIL, naked, Egyptian crude, spot, £32 ; July-August, £31 10s. ; edible refined, spot, £35 10s. ; technical, spot, £35 ; deodorised, spot, £37 10s. PALM KERNEL OIL.—Crude, naked 5½ per cent., spot, £36 10s. GROUNDNUT OIL.—Crushed extracted, spot, £35 ; deodorised, £39. SOYA OIL.—Extracted, £33 ; crushed, £33 ; deodorised, £36 10s. RAPE OIL.—Crushed extracted, £41 ; refined, £43. TURPENTINE, spot, 40s. 6d. per cwt.

South Wales By-Products

SOUTH WALES by-product activities continue to show slight improvement. More attention is being paid to most products and values are being maintained all round. Pitch has a stronger demand and there has been a slight spurt in forward buying for end of the year delivery on a basis of 38s. to 40s. per ton. Road tar has an increased call with values unchanged at from 10s. 6d. to 13s. per 40-gallon barrel, while crude tar is unchanged with quotations ranging from 25s. to 30s. per ton. Creosote remains weak with prices unchanged at from 3½d. to 4¾d. per gallon, but motor benzol is easier at from 1s. 3d. to 1s. 6d. per gallon. Refined tars have a good, moderate market with values unchanged. Crude naphthalene is weak, while there is scarcely any demand for whizzed. Patent fuel and coke exports are more satisfactory, but prices are unchanged. Patent fuel quotations are :—Ex-ship Cardiff, 21s. to 21s. 6d. ; ex-ship Swansea, 20s. to 20s. 6d. per ton. Coke prices are :—Furnace, 21s. to 23s. : good foundry, 26s. 6d. to 32s., and best foundry from 32s. 6d. to 36s. 6d. per ton. Oil imports over the last four ascertainable weeks totalled 16,812,845 gallons—all Persian oil.

Canadian Soil Improvement Campaign

THE Provincial Minister of Agriculture recently announced that Ontario will launch a comprehensive programme of soil improvement work this summer. The Ontario Department of Agriculture, the Ontario Agricultural College, and a number of commercial interests will co-operate in the undertaking. The project includes 319 fertiliser and soil improvement demonstrations to be held throughout the province ; the production of soil maps compiled from surveys of as many counties as can be gone over this year ; the establishment of permanent experimental fertility fields at various points, and an educational campaign on soil improvement to be conducted through newspapers and county agricultural representatives. Fertiliser manufacturers of eastern Canada have subscribed funds for demonstrations and are also providing the fertiliser. Funds are being contributed by the Chilean Nitrate of Soda Educational Bureau to place a full-time expert at 38 of the demonstrations. Canning interests also are contributing funds for fertiliser experiments on canning crops, with special reference to quality in tomatoes, and tobacco interests are co-operating in 120 experiments with fertiliser on tobacco. The experimental union is also contributing. (U.S.A. Assistant Trade Commissioner William P. Sargent, Jr., Toronto, Canada.)

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, July 17, 1929.

DUE to local holidays, there has been little moving in the Scottish heavy chemical market during the past week. Prices are practically unchanged, one exception, as stated last week, being acetic acid, which is obtaining good prices for prompt delivery.

Industrial Chemicals

ACETONE.—B.G.S., £76 10s. to £85 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—98/100% Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flaked, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC ICE CRYSTALS.—Unchanged at 6½d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC B.P. CRYSTALS.—Quoted 2s. 2½d. per lb., less 5%, ex store, spot delivery. Offered at 2s. 2½d. per lb., less 5% ex wharf, prompt shipment from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80° QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Price remains unchanged at about 3½d. per lb., ex store. Offered for prompt shipment from the Continent at 3½d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton for 158° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Spot material now quoted 1s. 4½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—In scarce demand and price now quoted about £7 per ton, ex wharf.

ALUM LUMP POTASH.—Unchanged at about £8 12s. 6d. per ton, c.i.f. U.K. ports. Crystal meal offered on spot at £9 per ton, ex store.

AMMONIA ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Quoted £37 per ton, c.i.f. U.K. ports, prompt shipment from China. Spot material unchanged at about £40 per ton, ex store.

ARSENIC, WHITE POWDERED.—Unchanged at £18 5s. per ton, ex wharf, prompt despatch from mines. Spot material quoted £19 15s. per ton, ex store.

BARIUM CHLORIDE.—Quoted £10 10s. per ton, c.i.f. U.K. ports, prompt shipment.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price £4 5s. per ton to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Still in fairly good demand and price now quoted is £36 10s. per ton, ex store.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—On offer at £29 15s. per ton, ex store.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 10s. per ton; brown on offer at about £39 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4⅞d. per lb. delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum 2½ tons to be taken.

POTASSIUM CARBONATE 96/98%.—Spot material now quoted £26 10s. per ton, ex store. Offered from the Continent £25 10s. per ton, c.i.f. U.K.

POTASSIUM CHLORATE 99¾/100% Powder.—Quoted £25 10s. per ton, ex wharf. Crystals, 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Offered for prompt shipment from the Continent at 6¾d. per lb., ex wharf. Spot material quoted 7d. per lb., ex store.

SODA, CAUSTIC.—Powdered 98/99%. Now £17 10s. per ton in drums; £18 15s. per ton in casks. Solid 76/77%, £14 10s. per ton in drums and 70/75%, £14 2s. 6d. per ton in drums, all carriage paid buyers' stations, minimum 4-ton lots, for contracts, 10s. per ton less.

SODIUM ACETATE. 65%.—Crystal quality quoted about £19 15s. per ton, ex wharf. 63/78% Anhydrous quality on offer at £20 per ton, carriage paid buyers' stations.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Manufacturers advise an advance in price of ½d. per lb., making the spot price now 3⅜d. per lb., delivered as from July 1, with special concession for contracts from 2½ tons up to 25 tons.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 1s. 3d. per ton, ex quay, minimum 4-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Ordinary quality quoted £10 12s. per ton, carriage paid, buyers' sidings, minimum 6-ton lots, usual extras for small quantities and refined qualities.

SODIUM PRUSSIATE.—Spot material quoted 7d. per lb. Offered for prompt shipment from the Continent at 6¾d. per lb., c.i.f. U.K. ports.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton delivered for unground quality. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid 60/62%, £9 per ton. Broken, 60/63%, £10 per ton. Crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now quoted at £22 10s. per ton f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small quantities.

British Standard Specification for Turpentine

A BRITISH standard specification (No. 290-1929) for turpentine, type 2, has just been published by the British Engineering Standards Association. This specification is yet another of the comprehensive series of standard specifications for paints, varnishes and paint ingredients published by this Asscociation, and covers turpentine distilled from pine-oleo-resins and from resinous wood by steam or destructive distillation. An earlier specification published in 1926 (No. 244-1926) deals with turpentine, type 1, which covers American gum spirits or spirits of turpentine. The specification now published contains clauses covering specific gravity, distillation, residue, refractive index, polymerisation and flash point; appendices are added giving a standard method of distillation and polymerisation test. Copies may be obtained from the British Engineering Standards Association, Publications Department, 28, Victoria Street, London, S.W.1, price 2s. 2d., post free.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, July 18, 1929.

The threatened stoppage of operations in the Lancashire cotton industry, through a wage dispute, is having an unsettling influence on the chemical market here, although, up to the present, it has not had much actual effect on the volume of business. Contract deliveries of textile chemicals this week have been about up to their recent volume, except where holiday stoppages have resulted in a temporary interruption. In the open market, considering the period of the year, inquiry is fairly good and a moderate trade is passing.

Heavy Chemicals

Hyposulphite of soda is in moderate request, with current offers of the photographic quality ranging from about £15 to £15 10s. per ton and of the commercial material at round £8 15s. Bicarbonate of soda meets with a quietly steady demand, largely on contract account, and quotations are firm at £10 10s. per ton. There is only a relatively quiet business going through in the case of chlorate of soda and values are still easy in tendency, an average price to-day being about 2⅝d. per lb. Bichromate of soda keeps steady on the basis of 3⅜d. per lb., and buying interest in this material keeps up at a fairly satisfactory level. There is little fresh to record in respect of alkali and caustic soda, quotations being very firm and the demand reasonably steady. Offers of alkali are at round £6 per ton, in contracts, with caustic quoted at from £12 15s. to £14 per ton, according to quality, and also on a contract basis. Inquiry for saltcake is on somewhat quiet lines still, with offers at about £2 15s. per ton. With regard to prussiate of soda, prices are well maintained and a moderate volume of business is going through at from 4¾d. to 5¼d. per lb., according to quantity. Phosphate of soda is still on offer at round £11 15s. per ton, but there is only a relatively quiet trade being done. Sulphide of sodium is rather slow, but there has been no change in price levels compared with a week ago, the commercial grade being offered at £8 per ton and the 60-65 per cent. concentrated solid at £9.

There is a fair inquiry about for yellow prussiate of potash, values of which are held at from 6¾d. to 7¼d. per lb., according to quantity. Permanganate of potash is in moderate request and quotations are steady in the neighbourhood of 5½d. per lb. for the B.P. kind and 5¼d. for the commercial. Chlorate of potash continues on offer at from 2¾d. to 3d. per lb., although the movement of this material is on comparatively narrow lines. There has been no further change in the price position of caustic potash, offers of which range from £32 10s. per ton, upwards, according to quantity. Carbonate of potash is on the easy side at round £25 15s. per ton for the 96 per cent. solid quality. Bichromate of potash is firm at 4⅜d. per lb., and a fair trade is being put through.

Sulphate of copper is receiving a moderate amount of attention, with current offers at from £27 10s. to £27 15s. per ton, f.o.b. Arsenic keeps reasonably steady although there has been no apparent improvement in the demand for this material; white powdered, Cornish makes, are obtainable at about £16 per ton, at the mines. The lead products are easy in tendency in sympathy with the metal, with nitrate at from £33 10s. to £34 per ton, and white and brown acetate at £39 and £40. The acetates of lime meet with a moderate inquiry and prices are held at about £8 5s. per ton for the brown quality and £16 10s. for the grey.

Acids and Tar Products

Acetic acid continues in active demand and quotations are firm at £36 per ton for the 80 per cent. commercial and from £66 to £67 per ton for the glacial. There is only a quiet trade passing in the case of oxalic acid, offers of which are maintained at the higher level of £1 12s. 6d. to £1 13s. per cwt., ex store. Tartaric acid is steady at from 1s. 4¼d. to 1s. 4½d. per lb. and a moderate inquiry has been reported here this week. Citric acid is on the quiet side, with bulk supplies obtainable at round 2s. 1d. per lb.

Pitch, for forward shipment, meets with a moderate demand and prices are steady at £2 to £2 2s. 6d. per ton, f.o.b. Creosote oil, however, continues slow at about 2¾d. per gallon, at works. There is a persistent call for carbolic acid, both crude and crystal, and quotations are very firm at 2s. 2d. to 2s. 3d. per gallon, naked, and about 7d. per lb., f.o.b. Solvent naphtha is selling in moderate quantities at round 1s. 2d. per gallon.

Company News

Arizona Copper Co.—It is announced that the liquidator of the company will pay a final dividend of 3s. 5⅝d. per share on July 30. A dividend of 40s. per share has already been paid.

Courtaulds, Ltd.—An interim dividend of 4 per cent., free of income tax, is announced on the ordinary shares, payable on August 9 to shareholders on the books at the close of business on July 11.

W. and H. M. Goulding.—The directors have decided to recommend a dividend at the rate of 5½ per cent. on the preference shares and 6 per cent. (as compared with 5 per cent. last year) on the ordinary shares for the year ended June 30, 1929. These dividends will be payable, as usual, in two equal instalments on July 31 and December 31 next, less income-tax at 3s. in the £.

Lautaro Nitrate Co.—Holders of share warrants to bearer of the Lautaro Nitrate Co. are informed that under the scheme it is proposed, subject to the matter being carried through, that the distribution of the "no par value shares" be made on or after October 15 next, that a dividend of 3 per cent. be paid on October 25 next, and that a second dividend of 3 per cent. be paid on December 31 next.

Nuera Art Silk Co.—A trading loss of £12,508 is reported for 1928, which is reduced to £8,682 by receipts from interest, rents, etc. The development account has been increased during the year by £59,882 to £102,548 by proportion of salaries, wages, general trade charges, etc. allocated to that account. After transferring £31,603 from the capital premium account, the development account stands at £70,945.

Allen-Liversidge.—After charging repairs, maintenance, depreciation, income-tax and all other expenses, the trading for the year ended April 30, 1929, has resulted in a net profit of £73,407, to which is added £7,609 brought forward, making £81,016. To general reserve is placed £15,000; to reserve against freehold properties £5,000, while stamp duties on increase of capital and expenses of issue of 50,000 preference shares of £1 each in October, 1928, takes £2,347, leaving £58,668. The directors recommend a final dividend of 5 per cent. (less tax) be paid, making 10 per cent. for the year, carrying forward £14,043.

British Oxygen Co.'s Progress

Mr. K. S. Murray, presiding at the 43rd general meeting of the British Oxygen Co., Ltd., at the Great Eastern Hotel, London, on Tuesday, congratulated the shareholders on a year of satisfactory progress. In regard to the sale of their principal product, viz., oxygen, he said that the year had been one of steady increase in output, which had enabled a further reduction to be made in the average price of that gas.

Referring to the recent arrangement with Liquid Air, Ltd., he stated that it was not likely that the average price of oxygen would be increased as a result of this arrangement, for it was proposed to close the factories of Liquid Air, Ltd., and as the business done by the latter would thus revert to the British Oxygen Co., Ltd., the economic advantage of the increased output would tend to decrease production costs, and to that extent should enable the company to further reduce the average price of oxygen. The only factor likely to raise the price of oxygen would be a reduced demand, and of that he was glad to say there was no indication at present.

Orders had been secured, the chairman said, for oxygen and other gas plants and machinery, both at home and in the Dominions, as well as from the Government, and these, coupled with the construction of new plants and the reconditioning of the company's old plants, had made it necessary to enlarge the Edmonton works. He referred to trials which were being made by the company in this country, concurrently with similar trials in other countries, in connection with the transportation of oxygen in the liquid state, and expressed the opinion that, although the transport of liquid oxygen might be usefully adopted under certain conditions, the method was not likely to displace the supply of the gas in cylinders to any large extent. The company's business in the production and sale of other gases, such as carbon dioxide, nitrous oxide, nitrogen, hydrogen and argon, continued to be satisfactory, all of them showing an appreciable increase.

Power Station Fumes

Appeal by Manchester Corporation

In the House of Lords last week, Viscounts Dunedin and Sumner and Lord Blanesburgh continued the hearing and the appeal of the Lord Mayor and Corporation of Manchester, which arose out of a claim, by Mr. Arthur Farnworth, for damages and for an injunction to restrain the Corporation from causing to issue from their electrical power station at Barton-upon-Irwell, in the County of Lancashire, offensive, poisonous, unwholesome and deleterious smoke fumes, gases and noxious matters in such a manner that they were spread and diffused over Mr. Farnworth's farm-house, buildings, and land farmed by him.

The Corporation admitted a substantial nuisance, but contended that by virtue of the Manchester Corporation Act (1914), they were entitled to use the generating station, even though they could not do so without causing a nuisance to Mr. Farnworth.

Mr. Justice Talbot decided for the Corporation, but the Court of Appeal by a majority reversed his judgment.

Mr. W. E. Tyldesley Jones, K.C., following Mr. Cyril Atkinson, K.C., for the Corporation, gave instances of Parliament authorising supplies within an area which excluded the Nuisance Clause of the Electric Lighting (Clauses) Act of 1899. He contended that Parliament did not intend to incorporate the provisions of the Clauses Act in the Corporation Act of 1914, for such inclusion would have resulted in two sets of provisions applying in the same area of supply with reference to the same matter, but in different terms.

Mr. J. E. Singleton, K.C., for the farmer, submitted that the Corporation failed to satisfy the onus of proof that all reasonable precautions had been taken to avoid causing a nuisance.

At the close of the hearing on Tuesday judgment was reserved.

Birmingham's Research Laboratory

The connection of the work of the Birmingham Corporation industrial research laboratory and its value to industry formed the subject of the weekly talk to the Birmingham Rotary Club at their luncheon last week.

Mr. V. E. Green, assistant director of the laboratories, pointed out that they were a section of the Gas Department. Birmingham was the home of many industries, and a number of manufacturers specialising in a few operations had not their own facilities for hardening tools and dies, case hardening steel components, and so on. Those were dealt with by the department concerned in ever-increasing number. In one particular case, a large export trade was built up by a local manufacturer on the results of long and careful research by this section on the heat treatment of one class of his products. Testing the strength of metals, cements, concretes and other materials was carried out daily. The Air Ministry stipulated that all materials used by them must be carefully tested in accordance with British engineering standards and other specifications, and the research laboratories, as an Air Ministry approved test house, fulfilled a local need owing to many manufacturers on the Air Ministry list having no testing appliances of their own. Mr. Green believed that owing to the stringent requirements of the Air Ministry, many manufacturers in the Birmingham district were in a much better position to quote against foreign competition for home and export trade; in other words, they knew their own products better.

British Glues and Chemicals, Ltd.

At the ninth general meeting of British Glues and Chemicals, Ltd., which was held in London on July 11, Mr. T. Walton, who presided, said that the reorganisation which they had authorised a year ago had proved a great benefit to the company, and had contributed to the more satisfactory results, but the improvement was in great measure the outcome of many years' unceasing determination on the part of their joint managing directors, well supported by all concerned in their organisation, to pull through. Stock in trade, he said, stood lower than at any time previously, reflecting credit upon those responsible for sales, and upon the products themselves. Their exports to the Dominions and colonies and to the other parts of the world continued to grow, and were repaying them for their pioneer work, and there was justification for regarding with some satisfaction the position occupied by their company amongst the leading firms in the world in their trade.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

MATTHEWS AND WILSON, LTD., c/o Archdeacon and Waller, 18, Old Broad Street, E.C., manufacturing chemists. (C.C., 20/7/29.) £10 10s. 1d. June 14.

Receivership

BLACK AND RICHARDS, LTD. (R., 20/7/29.) A. M. Stray, of 74, Coleman Street, E.C., was appointed receiver on July 2, 1929, under powers contained in debenture dated February 1, 1928.

London Gazette, &c.

Companies Winding Up Voluntarily

MEXCO, LTD. (C.W.U.V., 20/7/29.) By reason of its liabilities, July 8. G. Bostock, 21, Ironmonger Lane, London, E.C.2, appointed as liquidator. Meeting of creditors at the offices of Annan, Dexter and Co., 21, Ironmonger Lane, London, E.C., on Tuesday, July 23, at 12.30 p.m.

TUSCHER AND PARTNERS, LTD. (C.W.U.V., 20/7/29.) By reason of its liabilities. July 8. H. Etherington, Incorporated Accountant, Granville House, Arundel Street, Strand, W.C.2, appointed as liquidator. Meeting of creditors at Incorporated Accountants' Hall, Victoria Embankment, W.C.2, on Monday, July 29, at 2 p.m.

Synthetic Ammonia and Nitrates

An extraordinary general meeting of the debenture stockholders of Synthetic Ammonia and Nitrates, Ltd., was held on Wednesday, at Winchester House, Old Broad Street, London.

Mr. Douglas Broad, representing the trustees for the Debenture stockholders, presided, and said that the object of the meeting was to pass the following resolution—viz., "That the debenture stockholders do hereby approve of Synthetic Ammonia and Nitrates, Ltd., entering into an agreement with Imperial Chemical Industries, Ltd., Brunner, Mond and Co., Ltd., and the Commissioners of His Majesty's Treasury in the terms of the draft already submitted to the debenture stockholders and identified by the signature of the chairman of the meeting." The Chairman explained that Imperial Chemical Industries, by virtue of its holding more than 99 per cent. of the issued capital of Brunner Mond and Co., now has the controlling interest in Synthetic Ammonia and Nitrates, and by the articles of association of the Synthetic Co., Imperial Chemical Industries was sole director and manager of the Synthetic Co. Imperial Chemical Industries had established a Central Obsolescence Fund for dealing with the depreciation of all companies which they controlled, and it was proposed to transfer the amount now standing to the credit of the Synthetic depreciation fund to their profit and loss account, and distribute it by way of dividend to Imperial Chemical Industries, who undertake to place a like amount to the Central Obsolescence Fund. The Treasury has approved the transaction. The proxy strength which had been given to the trustees was not sufficient to carry the resolution, and the meeting would, therefore, stand adjourned until Wednesday August 7, at Winchester House, E.C., at 3 p.m.

Memoranda on Paints, Varnishes, etc.

A memorandum on the market for paints, varnishes, etc., in Chile, has been forwarded to the Department of Overseas Trade, by the Commercial Secretary at Santiago. A similar report has also been received from H.M.'s Consul-General at Bogotá. British firms desirous of receiving copies should apply to the Department, 35, Old Queen Street, London, quoting reference numbers B.X. 5440 and B.X. 5424.